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10 CFR 50.55a

September 28, 2011

U.S. Nuclear Regulatory Commission Attention: Document Control Desk Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC (Duke Energy) Catawba Nuclear Station, Units 1 and 2 Docket Numbers 50-413 and 50-414 Proposed Relief Request Number 11-CN-001 for the Third Ten-Year Inservice Inspection Interval

Pursuant to 10 CFR 50.55a(g)(5)(iii), Duke Energy hereby requests NRC approval of the subject relief request for the remainder of the third ten-year inservice inspection interval at the Catawba Nuclear Station. This relief request is associated with limited weld examinations performed during the Unit 1 End-of-Cycle (EOC) 17 Refueling Outage (RFO), the Unit 1 EOC 18 RFO, and the Unit 2 EOC 16 RFO. The details of the request are included in the enclosure and its attachments. Duke Energy requests NRC approval of this request within one calendar year of the submittal date.

This submittal document contains no regulatory commitments.

If there are any questions or if additional information is needed, please contact L.J. Rudy at (803) 701-3084.

Very truly yours,

James R. Morris

**Enclosure/Attachments** 

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xc (with enclosure/attachments):

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#### Enclosure

Relief Request Number 11-CN-001

#### 1.0 Scope of Relief Request

Relief is requested pursuant to 10 CFR 50.55a(g)(5)(iii) for welds listed in Table 1. These welds were required to be examined in accordance with Inservice Inspection Plans for the following Units.

Catawba Nuclear Station - Unit 1 Third 10-Year Inservice Inspection Interval Interval Start Date: 29 June 2005

Catawba Nuclear Station - Unit 2 Third 10-Year Inservice Inspection Interval Interval Start Date: 15 October 2005

			Table 1		
Relief Request Section Number	<u>Catawba</u> <u>Unit</u> Number	Examination Performed (Refueling Outage)	<u>Weld ID</u> <u>Number</u>	<u>Item/Summary</u> <u>Number</u>	<u>Examination</u> <u>Data</u>
2.0	1	1EOC17	1PZR-W2	C1.B3.110.0002	See Attachment A Pages 1-11
3.0	1	1EOC17	1PZR-W3	C1.B3.110.0003	See Attachment A Pages 12-20
4.0	1	1EOC17	1ELDHX- HD-FLG	C1.C1.20.0003	See Attachment A Pages 21-28
5.0	1	1EOC17	1VCT-LH- SH	C1.C1.20.0019	See Attachment A Pages 29-35
6.0	1	1EOC17	1NI11-9	C1.C5.21.0002	See Attachment A Pages 36-42
7.0	1	1EOC18	1BNSHX- 2B-51C	C1.C1.30.0008	See Attachment B Pages 1-9
8.0	1	1EOC18	1BNSHX- 2A-50	C1.C1.30.0009	See Attachment B Pages 10-18
9.0	1	1EOC18	1SGD- W261	C1.C5.11.0001	See Attachment B Pages 19-23

10.0	1	1EOC18	1CA66-35	C1.C5.11.0002	See Attachment B Pages 24-31
11.0	2	2EOC16	2SGC-04B- 05	C2.C1.10.0002	See Attachment C Pages 1-19
12.0	2	2EOC16	2NI70-4	C2.B9.11.0106	See Attachment C Pages 20-23

Relief Request #11 CN 001

#### 2.0 Weld #1PZR-W2

2.1. ASME Code Component(s) Affected

Unit 1 Pressurizer Spray Nozzle to Upper Head Weld, Weld #1PZR-W2, Summary Number C1.B3.110.0002.

#### 2.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

#### 2.3. Applicable Code Requirement

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.110 Fig. IWB-2500-7 (b), 100% Volume Coverage of Examination Volume A-B-C-D-E-F-G-H

- 2.4. Impracticality of Compliance
  - Surface 1: Upper Head Carbon steel
  - Surface 2: Spray nozzle Carbon steel
  - Diameter: 12.750 in.
  - Thickness: 3.000 in.

The ultrasonic examination of this weld obtained 81.7% coverage of the required examination volume. Because of the weld configuration, the requirements of ASME Section V, Article 4, T-441.1.2(a), T-441.1.3, T-441.1.4, T-441.1.5 and T-441.1.6 could not be met. The aggregate coverage was calculated from the following base and weld metal scan results:

- Weld coverage using 35°& 45° shear waves for axial scans (S1, S2), and 35° & 45° shear waves for circ. scans (CW, CCW) obtained 91.9% coverage.
- Base material coverage using 35°, 45°& 60° shear wave for axial scans (S1) and 35°& 45° shear waves for circ. scans (CW, CCW) obtained 77.5% coverage.
- 0° scan coverage obtained 75.6% coverage.
- The aggregate coverage was calculated to be (91.9% + 77.5% + 75.6%)/3 = 81.7%.

The limitation was caused by the weld taper configuration created by the attachment of the spray nozzle to the upper head not allowing scanning from Surface 2. In order to scan all of the required volume for this weld, the upper head to spray nozzle attachment weld would have to be redesigned to allow scanning from both sides of the weld, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. The achieved coverage did not meet the acceptance criteria of this Code Case.

2.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

2.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

2.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.B3.110.0002 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each refueling outage in accordance with Table IWB-2500-1; Examination Category B-P requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring and other RCS leakage detection systems provide additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### **3.0** Weld #1PZR-W3

3.1. ASME Code Component(s) Affected

Unit 1 Pressurizer Safety/Relief Nozzle to Upper Head Weld, Weld #1PZR-W3, Summary Number C1.B3.110.0003

3.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

3.3. Applicable Code Requirement

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.110 Fig. IWB-2500-7 (a), 100% Volume Coverage of Examination Volume A-B-C-D-E-F-G-H-I

- 3.4. Impracticality of Compliance
  - Surface 1: Upper Head Carbon steel
  - Surface 2: Safety/Relief nozzle Carbon steel
  - Diameter: 15.000 in.
  - Thickness: 3.000 in.

The ultrasonic examination of this weld obtained 81.2% coverage of the required examination volume. Because of the weld configuration, the requirements of ASME Section V, Article 4, T-441.1.2(a), T-441.1.3, T-441.1.4, T-441.1.5 and T-441.1.6 could not be met. The aggregate coverage was calculated from the following base and weld metal scan results:

- Weld coverage using 35° & 45° shear waves for axial scans (S1, S2), and 35° & 45° shear waves for circ. scans (CW, CCW) obtained 93.0% coverage.
- Base material coverage using 35°, 45°& 60° shear wave for axial scans (S1) and 35° & 45° shear waves for circ. scans (CW, CCW) obtained 76.2% coverage.
- 0° scan coverage obtained 74.3% coverage.
- The aggregate coverage was calculated to be (93.0% + 76.2% + 74.3%)/3 = 81.2%.

The limitation was caused by the weld taper configuration created by the attachment of the safety/relief nozzle to the upper head not allowing scanning from Surface 2. In order to scan all of the required volume for this weld, the upper head to safety/relief nozzle attachment weld would have to be redesigned to allow scanning from both sides of the weld, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. The achieved coverage did not meet the acceptance criteria of this Code Case.

#### 3.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

3.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

3.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.B3.110.0003 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each refueling outage in accordance with Table IWB-2500-1; Examination Category B-P requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring and other RCS leakage detection systems provide additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### 4.0 Weld #1ELDHX-HD-FLG

4.1. ASME Code Component(s) Affected

Unit 1 Heat Exchanger Head to Flange Weld, Weld #1ELDHX-HD-FLG, Summary Number C1.C1.20.0003

#### 4.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

#### 4.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.20, Fig. IWC-2500-1(a), 100% Volume Coverage of Examination Volume A-B-C-D

4.4. Impracticality of Compliance

Surface 1: Carbon Steel Flange Surface 2: Stainless Steel Head Diameter: 9.5 inch Thickness: 0.750 inch

The ultrasonic examination of the Heat Exchanger head to flange weld obtained 30.6% coverage of the required examination volume. ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. Due to the presence of nozzles, the scanning was limited in each direction for 50% of the total weld length. The total aggregate percent of coverage was calculated as follows:

Axial scans

- 45° shear waves obtained 0.00% coverage at location of 4 nozzles
- 45° shear waves & 70RL waves obtained 29.7% coverage at remaining length
- Total axial coverage obtained 0.00% + 29.7% = 29.7%

Circ scans

- 45° shear waves obtained 13.2% coverage at location of 4 nozzles
- 45° shear waves obtained 18.2% coverage at remaining length
- Total axial coverage obtained 13.2% + 18.2% = 31.4%
- This aggregate coverage was calculated to be (29.7% + 31.4%) = 61.1%/2 = 30.6%

The limitations were caused by the four physical scanning limitations, all located on the S2 head side. In order to scan all of the required volume for this weld, the heat exchanger would have to be redesigned to allow scanning from both sides of the weld, which is impractical. The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-B-C-D. The achieved coverage did not meet the acceptance criteria of this Code Case.

4.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

4.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

4.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C1.20.0003 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

In addition to the above Code required volumetric examination, Reactor Building Normal Sump monitoring provides additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### 5.0 Weld #1VCT-LH-SH

5.1. ASME Code Component(s) Affected

Unit 1 Tank Lower Head to Shell Weld, Weld #1VCT-LH-SH, Summary Number C1.C1.20.0019

#### 5.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

5.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.20, Fig. IWC-2500-1(a), 100% Volume Coverage of Examination Volume A-B-C-D

5.4. Impracticality of Compliance

Surface 1: Stainless Steel Shell Surface 2: Stainless Steel Lower Head Diameter: 90.00 inch Thickness: 0.250 inch

The ultrasonic examination of the lower head to shell weld obtained 89.4% coverage of the required examination volume. ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. Due to the presence four support legs, scanning was limited in each direction for 10.6% of the total weld length. The total aggregate percent of coverage was calculated as follows:

- 45° shear waves obtained 89.4% coverage in one axial direction (S1 shell)
- 45° shear waves obtained 89.4% coverage in one axial direction (S2 head)
- 45° shear waves obtained 89.4% coverage in one circ. direction (S3 CW)
- 45° shear waves obtained 89.4% coverage in one circ. direction (S4 CCW)
- This aggregate coverage was calculated to be (89.4% + 89.4% + 89.4%)/4 = 89.4%)

The limitations were caused by the four support leg scanning limitations. In order to scan all of the required volume for this weld, the volume control tank would have to be redesigned to allow scanning in each required direction, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-B-C-D. The achieved coverage did not meet the acceptance criteria of this Code Case.

5.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

5.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

5.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C1.20.0019 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), periodic visual inspections performed by plant operators provide additional assurance that in the event leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the continuing periodic leakage inspections, it is Duke's position that the combination of examinations provides a reasonable assurance of quality and safety.

#### 6.0 Weld #1NI11-9

6.1. ASME Code Component(s) Affected

Unit 1 Piping Elbow to Tee Weld, Weld #1NI11-9, Summary Number C1.C5.21.0002

#### 6.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

6.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-F-1, Item Number C5.21 Figure IWC-2500-7(a), 100% Volume Coverage of Examination Volume C-D-E-F

6.4. Impracticality of Compliance

Component configuration:

- Surface 1: Stainless steel elbow
- Surface 2: Stainless steel tee
- Diameter: NPS 4.0 in.
- Thickness: 0.531 in.

Scanning requirements are described in 10CFR.50.55a (b)(2)(xv)(A)(1). The aggregate coverage was calculated from the following:

- 60° shear waves obtained an aggregate coverage of 64.8% in one axial direction (S1 elbow)
- 60° shear waves obtained an aggregate coverage of 50.8% in one axial direction (S2 tee)
- 45° shear waves obtained 92.2% coverage in two circ directions on the elbow side (S1).
- 45° shear waves obtained 100% coverage in two circ directions on the tee side (S2).
- The aggregate coverage was calculated to be (64.8% + 50.8% + 92.2% + 100%)/4 = 77.0%.

The limitation was caused by the tee configuration, as well as a pipe running adjacent to the tee side of the weld. In order to scan all of the required volume for this weld, the valve would have to be redesigned, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. Therefore, the available coverage will not meet the acceptance criteria of this Code Case.

#### 6.5. Proposed Alternative and Basis for Use

This weld was examined using procedures, equipment, and personnel qualified in accordance with ASME Section XI, Appendix VIII. No alternative examinations are planned for the weld during the current inspection interval. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Additionally, radiography has not been qualified through performance demonstration.

#### 6.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

6.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C5.21.0002 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on this C5.21 item and achieved 100% coverage. The result from the surface examination was acceptable.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), Reactor Building Normal Sump monitoring provide additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the acceptable results of the surface examinations performed during this outage, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### 7.0 Weld #1BNSHX-2B-51C

7.1. ASME Code Component(s) Affected

Unit 1 Heat Exchanger Tubesheet to Shell Weld, Weld #1BNSHX-2B-51C, Summary Number C1.C1.30.0008

#### 7.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

7.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.30, Fig. IWC-2500-2, 100% Volume Coverage of Examination Volume E-F-G-H

7.4. Impracticality of Compliance

Surface 1: Stainless Steel Tubesheet Surface 2: Stainless Steel Shell Diameter: 49.0 inch Thickness: 0.50 inch

ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. The total aggregate percent of coverage was calculated as follows.

- 60° shear waves obtained 0% coverage in one axial direction (S1 tubesheet)
- 60° shear waves obtained 20.694% coverage in one axial direction (S2 shell)
- 60° shear and longitudinal waves obtained 45.739% coverage in one circ. direction (S3 CW)
- 60° shear and longitudinal waves obtained 45.739% coverage in one circ. direction (S4 CCW)
- The aggregate coverage was calculated to be (0% + 20.694% + 45.739%) + 45.739%)/4 = 28.043%

The limitations were caused by the tubesheet configuration, as well as one nozzle within the weld length. In order to obtain full coverage, the component would have to be redesigned, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-B-C-D. The achieved coverage did not meet the acceptance criteria of this Code Case.

7.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

#### 7.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

#### 7.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C1.30.0008 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), periodic visual inspections performed by plant operators provide additional assurance that in the event leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the continuing periodic leakage inspections, it is Duke's position that the combination of examinations provides a reasonable assurance of quality and safety.

#### 8.0 Weld #1BNSHX-2A-50

8.1. ASME Code Component(s) Affected

Unit #1 Heat Exchanger Tubesheet to Shell Weld, Weld #1BNSHX-2A-50, Summary Number C1.C1.30.0009

#### 8.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

#### 8.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.30, Fig. IWC-2500-2, 100% Volume Coverage of Examination Volume E-F-G-H

8.4. Impracticality of Compliance

Surface 1: Stainless Steel Shell Surface 2: Stainless Steel Tubesheet Diameter: 49.0 inch Thickness: 0.625 inch

ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. The total aggregate percent of coverage was calculated as follows.

- 60° shear waves obtained 12.498% coverage in one axial direction (S1 shell)
- 60° shear waves obtained 0% coverage in one axial direction (S2 shell)
- 60° shear and longitudinal waves obtained 49.569% coverage in one circ. direction (S3 – CW)
- 60° shear and longitudinal waves obtained 49.569% coverage in one circ. direction (S4 – CCW)
- <u>The aggregate coverage was calculated to be (12.498% + 0% + 49.569%</u> + 49.569%)/4 = 27.909%

Actual length of weld measured @ 159.3 in. Description of limitations as follows:

- S1: 4 Support lugs and 2 lugs limited scanning to 49.05% of total weld length
- S2: Tubesheet configuration limited scanning 100% of total weld length (no scan)
- S3: 2 Nozzles limited scanning to 93.00% of total weld length
- S4: 2 Nozzles limited scanning to 93.00% of total weld length

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-

B-C-D. The achieved coverage did not meet the acceptance criteria of this Code Case.

8.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

8.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

8.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C1.30.0009 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), periodic visual inspections performed by plant operators provide additional assurance that in the event leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the continuing periodic leakage inspections, it is Duke's position that the combination of examinations provides a reasonable assurance of quality and safety.

#### 9.0 Weld #1SGD-W261

9.1. ASME Code Component(s) Affected

Unit #1 Nozzle to Transition Ring Weld, Weld #1SGD-W261, Summary Number C1.C5.11.0001

#### 9.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

9.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-F-1, Item Number C5.11 Figure IWC-2500-7(a), 100% Volume Coverage of Examination Volume C-D-E-F

9.4. Impracticality of Compliance

Component configuration:

- Surface 1: Inconel Transition Ring
- Surface 2: Carbon Steel Nozzle
- Diameter: 7.5 in.
- Thickness: 1.12 in.

Scanning requirements are described in 10CFR.50.55a (b)(2)(xv)(A)(1). The aggregate coverage was calculated from the following:

- 45° & 60° refracted longitudinal waves obtained 100% coverage in one axial direction (S1 – transition ring)
- 42° refracted longitudinal waves obtained 37.14% coverage in two circ directions.
- The aggregate coverage was calculated to be (100% + 37.14%)/2 = 68.57%.

The limitation was caused by the nozzle taper configuration, which limited coverage in the circ direction only, as Appendix VIII, Supplement 10 demonstrations are qualified for single sided coverage in one axial direction. In order to scan all of the required volume for this weld, the nozzle would have to be redesigned, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. Therefore, the available coverage will not meet the acceptance criteria of this Code Case.

#### 9.5. Proposed Alternative and Basis for Use

This weld was examined using procedures, equipment, and personnel qualified in accordance with ASME Section XI, Appendix VIII. No alternative examinations are planned for the weld during the current inspection interval. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Additionally, radiography has not been qualified through performance demonstration.

#### 9.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

#### 9.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C5.11.0001 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on this C5.11 item and achieved 100% coverage. The result from the surface examination was acceptable.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface and pressure test), there are other activities which provide confidence that, in the event that leakage did occur through this weld, it would be detected and proper action taken. Reactor Building Normal Sump rate monitoring provide additional assurance that any leakage would be detected prior to gross failure of the component.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the acceptable results of the surface examinations performed during this outage, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring it is Duke's position that the combination of examinations provides a reasonable assurance of quality and safety.

#### **10.0** Weld #1CA66-35

10.1. ASME Code Component(s) Affected

Unit #1 Transition Ring to Elbow Weld, Weld #1CA66-35, Summary Number C1.C5.11.0002

10.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

10.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-F-1, Item Number C5.11 Figure IWC-2500-7(a), 100% Volume Coverage of Examination Volume C-D-E-F

10.4. Impracticality of Compliance

Component configuration:

- Surface 1: Inconel Transition Ring
- Surface 2: Carbon Steel Elbow
- Diameter: 6.0 in.
- Thickness: 0.71 in.

Scanning requirements are described in 10CFR.50.55a (b)(2)(xv)(A)(1). The aggregate coverage was calculated from the following:

- 45° & 60° refracted longitudinal waves obtained 100% coverage in two axial direction (S1 – nozzle, S2 - elbow)
- 42° refracted longitudinal waves obtained 54.24% coverage in two circ directions.
- The aggregate coverage was calculated to be (100% + 54.24%)/2 = 77.12%.

The limitation was caused by the nozzle taper configuration, which limited coverage in the circ directions only. In order to scan all of the required volume for this weld, the nozzle would have to be redesigned, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. Therefore, the available coverage will not meet the acceptance criteria of this Code Case.

#### 10.5. Proposed Alternative and Basis for Use

This weld was examined using procedures, equipment, and personnel qualified in accordance with ASME Section XI, Appendix VIII. No alternative examinations are planned for the weld during the current inspection interval. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Additionally, radiography has not been qualified through performance demonstration.

#### 10.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on July 15, 2014.

#### 10.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C1.C5.11.0002 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on this C5.11 item and achieved 100% coverage. The result from the surface examination was acceptable.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface and pressure test), there are other activities which provide confidence that, in the event that leakage did occur through this weld, it would be detected and proper action taken. Reactor Building Normal Sump rate monitoring provide additional assurance that any leakage would be detected prior to gross failure of the component.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the acceptable results of the surface examinations performed during this outage, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### 11.0 Weld #2SGC-04B-05

11.1. ASME Code Component(s) Affected

Unit 2 Steam Generator Lower Shell to Transition Cone Weld, Weld #2SGC-04B-05, Summary Number C2.C1.10.0002

#### 11.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

#### 11.3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.10, Fig. IWC-2500-1(c), 100% Volume Coverage of Examination Volume J-K-L-M

#### 11.4. Impracticality of Compliance

Surface 1: Carbon Steel Transition Cone Surface 2: Carbon Steel Lower Shell Diameter: 129.0 inch Thickness: 3.0 inch

The ultrasonic examination of the lower shell to transition cone weld obtained 46.872% coverage of the required examination volume. ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. The total aggregate percent of coverage was calculated as follows.

- The aggregate coverage from the 0° in the weld and base material obtained 39.440% coverage.
- The aggregate coverage from the 45° shear waves in the weld and base material obtained 49.183% coverage.
- The aggregate coverage from the 35°, 60° shear waves in the weld and base material obtained 52.278% coverage.

The total aggregate coverage obtained was (39.440% + 49.183% + 52.278%)/3 = 46.967%.

The limitations were caused by the upper lateral support. In order to obtain full coverage, the lateral support would have to be redesigned, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-B-C-D. The achieved coverage did not meet the acceptance criteria of this Code Case.

11.5. Proposed Alternative and Basis for Use

Radiography (RT) is not a desired option because there is no access for film placement.

No other substitution alternative for this weld is available which would provide better coverage.

11.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on August 19, 2016.

11.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C2.C1.10.0002 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring provide additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### 12.0 Weld #2NI70-4

12.1. ASME Code Component(s) Affected

Unit 2 Pipe to Valve 2NI175 Weld, Weld #2NI70-4, Summary Number C2.B9.11.0106

12.2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

12.3. Applicable Code Requirement

IWB-2500, Table IWB-2500-1, Examination Category B-J, Item Number B9.11 Figure IWB-2500-8 (c), 100% Volume Coverage of Examination Volume C-D-E-F

12.4. Impracticality of Compliance

Component configuration:

- Surface 1: Stainless Steel Pipe
- Surface 2: Forged Stainless Steel Valve
- NPS: 6.00 in.
- Thickness: 0.719 in.

Scanning requirements are described in 10CFR.50.55a (b)(2)(xv)(A)(1). The aggregate coverage was calculated from the following:

- 60° shear waves obtained 50% coverage in one axial direction (S1 pipe)
- 60° shear waves obtained 0% coverage in one axial direction (S2 valve)
- 60° shear waves obtained 50% coverage in one circ. direction (CW).
- 60° shear waves obtained 50% coverage in one circ. direction (CCW).
- The aggregate coverage was calculated to be (50% + 0% + 50% + 50%)/4 = 37.5%.

The component limitation was caused by the taper configuration of the valve, which did not allow access for scanning. In order to scan all of the required volume for this weld, the component would have to be redesigned, which is impractical.

The Catawba Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. Therefore, the available coverage will not meet the acceptance criteria of this Code Case.

#### 12.5. Proposed Alternative and Basis for Use

This weld was examined using procedures, equipment, and personnel qualified in accordance with ASME Section XI, Appendix VIII. No alternative examinations are planned for the weld during the current inspection interval. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Additionally, radiography has not been qualified through performance demonstration.

#### 12.6. Duration of Proposed Alternative

This request is for the duration of the third inservice inspection interval, currently scheduled to end on August 19, 2016.

#### 12.7. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C2.B9.11.0106 was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on this B9.11 item and achieved 100% coverage. The result from the surface examination was acceptable.

The system leakage test performed each refueling outage in accordance with Table IWB-2500-1; Examination Category B-P requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), Reactor Building Normal Sump monitoring and other RCS leakage detection systems provide additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the acceptable results of the surface examinations performed during this outage, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

#### Attachment A

### Unit 1 EOC 17 Examination Data

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## **UT Vessel Examination**

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Sit Summa	e/Unit: ry No.:	Catawb C	a / :1.B3.11(	1 0.0002			Procee	rocedure: _ Jure Rev.: _	NDE-640 4	)		Outage No.: Report No.:	U	C1-17 JT-08-0	07
	scope:		ISI				Work	Drder No.:	01756752	2		Page:	1	of	1
Code: Drawing No.: System ID:	NC	1998/20 Cl	000A NM 1201	.01-175	/1	Cat./Item	: <u>B-D/B3</u> Description:	Nozzle to H	Location:						
Component ID: Limitations:	1PZR- Yes - 5	N2 lee Limi	tation in	formati	ión on R	eport UT	-08-009		Size/Length:	NA art Time:	Thi 1441	ickness/Diamo Finish Ti	eter: ime:	3.000 / 16	12.750 10
Examination S	urface:	insi	de 🔲	Ol	utside 🖌	l	Surface Cor	ndition: <u>GRC</u>	DUND			·····.			
Lo Location:		9,	2.3		Wol	ocation:	Centerline of	Weld	Couplant:	ULTRAG	EL II	_ Batch No	.:	071	25
Temp. Tool Mi	ʻg.:	न	ISHER		Se	eriai No.:	MCNDE 27	220	Surface Temp.:	69	•F				
Cal. Report No	».:						CAL-08-013								
Angle Used Scanning dB Indication(s): Comments:	0 41.8 Yes [	N	45T	60	60T		Scan Coverage: L	Jpstream 🗹	Downstream 🗹	cw	CCV	v 🗹			
Results: Percent Of Co	Acc verage	ept 🔲 Obtained	Rej( J > 90%:	ect 🗹	ini <u>No - 81.7</u>	io 🗌 '%	Reviewed Previ	ous Data:	<u>. Yes</u>			i			
Examiner L Griebel, David	.evel () M.	-N	4	$D_r$	Signatu	P	Date 5/7/2008	Reviewer		ME	Sigr	nature		¢	Date
Examiner L Ellis, Ken	.evel 11	N	R		Signatur	e ,	Date 5/7/2008	Site Revie	W	Γ-	Sigr	nature		•	Date
Other L Keene, Dougla	.evel    s L.	n E	Day	 < X	Signatur	e 4	Date 5/7/2008	ANII Revie	W	- Âm	4Sh	ature .		<u></u>	Date

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ASH8/11/08

14 A	NDE-01 Provision 5 Proce 26 of 26
E N	NDC-91 Revision 5 Page 20 of 20
1AC	LIMITED EXAMINATION COVERAGE CHECKLIST
A 1 P A 1	ISI Summary No: <u>C1, B3, 110, 000</u> Z
	(UT) Verify search unit wedge index to nose dimension;
,	(UT) Draw the examination volume showing beam paths.
	(ALL) Draw the examination volume or area with obstructions including dimensions on the Supplemental Report, or if the drawing is too large, attach it to the Supplemental Report; (Marked-up drawings and/or digital photos are acceptable if dimensioned)
	(ALL) Note the scale of the drawing;
	(ALL) Calculate coverage in a detailed and orderly method; Note: Does not apply to hangers, snubbers, restraints or supports
	(ALL) Complete IDDEAL forms: "Limitation Work Sheet" and "Supplemental Report".
	(ALL) Check the "Reject" box on the examination data sheet.
	IWS NDE Level III Date 5/9/DB

Davil K. Date 05/12/08 MMP NDE Level III -

#### Figure 13 Limited Examination Coverage Checklist

VERIFY HARD COPY WITH NEDL VERSION IMMEDIATELY PRIOR TO INITIAL USE AND EVERY 14 DAYS THEREAFTER WHILE THE PROCEDURE IS IN USE

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ATTACHMENT A PAGE 3 OF 42



## **UT Vessel Examination**

Sit	e/Unit:	Catawba	a /	1			Pr	rocedure:	NDE-82	0	Ou	tage No.:	(	C1-17	
Summa	ry No.:	C	1.B3.11	0.0002			Proced	ure Rev.:	2		R	eport No.:	UT	-08-009	
Work	scope:		ISI				Work O	order No.:	0175675	j2		Page:	1	of	9
Code:		1998/20	A00			Cat./Item	: <b>B-D/B3.</b>	110	Location:						
Drawing No.:		Ch	M 1201	.01-175	//		Description:	Nozzle to H	ead						
System ID:	NC														
Component ID:	1PZR-	N2							Size/Length:	N/A	Thickr	ess/Diamet	er: 3	.000 / 1	2.750
Limitations:	Yes - S	ingle Si	ded Du	e to No	zzle				SI	art Time:	1441	Finish Tim	1e:	154	0
Examination S	urface:	Insid	de 📋	Ou	ıtside 🗹		Surface Con	dition: GRO	UND						
Lo Location:		9.	2.3		Wol	ocation:	Centerline of	Weid	Couplant:	ULTRAGE	<u>L I)</u>	Batch No.:		0712	5
Temp. Tool Mf	g.:	F	SHER		Se	rial No.:	MCNDE 272	20	Surface Temp.	69	*F				
Cal. Report No	).:				·	CAL-08	-014, CAL-08-015, C	AL-08-016							
Angle Used	0	45	45T	60	60T	35T									
Scanning dB		66.0	66.0	75.4	70.0	70.0									
Indication(s):	Yes		• []				Scan Coverage: U	pstream 🗹	Downstream	CW 🗹	ccw	3			
Comments:															
See attached	coveraj	ge and i	ndicatio	n data :	sheets.										
Results:	Acc	ept 📋	Rej	ect 🔽	Inf	• 🗌	Additional inspe	ectors: Josi	e Mulrhead / Ke	n Ellis	Inil	ledal	Z	10	4
Percent Of Co	verage	Obtained	> 90%:		<u>No-81.7</u>	*	Reviewed Previo	ous Data:	Yes		V · ·				
Examiner L	evel II.	-N	0	7	Signatur		Date	Reviewer			Signatu	Ire			Date
Griebel, David	M.		$\underline{\mathcal{N}}$	~ 1		· · ·	5/7/2008			111-	-11			5	117/20
Examiner L Stauffer, Leste	.evel III r, E.	I-N		15	Şignatur	°/	Date 5/7/2008	Site Review	V	<b>V</b> 1 –	Signatu	ire			Date
Other L	evel II	N	$\leq$		Signatur	e	Date	ANII Revie	W	$\mathcal{P}$	Signatu	ire			Date
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		Site/Uni	t: <u>Cata</u>	wba	1	1		P	rocedure		NDE-	820	0	utage No.:		:1-17	
Summary No.:			C1.B3.110.0002				Proces	Jure Rev		2		F	Report No.: UT-08-009			9	
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Sea	irch Unit Ar	igle:	35		0			O Pi	ping Wel	ds					N C	Vo St.	₩max I
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Corr	ments:													J.L		Ë	
														<b>*</b>		i	WI WINGS
Scan	Indication	%	V	N	For	ward	Bac	ward	L.	L	12	RBR	[	1	Remarks	3	
#	No.	Of	W	lax MP	W1	Of Max	W	of Max	Of Max	Max	Of May	Amp.					
S2	1	105%	1.1	3.4	N/A	N/A	N/A	N/A	N/A	3.25	N/A	N/A	ID Geometry				
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## **Ultrasonic Indication Report**

Dudee

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	L	Supplement	ai keport		Report No	).: <u>UT</u>	-08-009	
	•				Pag	e: <u>3</u>	of _9	)
Summary No.:	C1.B3.110.0002	_		$\wedge$				
Examiner:	Griebel, David M.	Level: 11-N	Reviewer:		NH III	Date:	5/17	3
Examiner:	Stauffer, Lester, E	Level: III-N	Site Review:	N/A	· · · · · · · · · · · · · · · · · · ·	Date:		
Other:	Keene, Douglas L. E. Conference	Level: <u>II-N</u>	ANII Review:	<u> </u>	Snget Jets	Date:	5-21	<u>0</u> 8

Comments: Ind. #1 - 35° was determined to be a geometric reflector due to weld root geometry. This area was previously recorded on PSI and ISI exam data which was resolved by review of radiographs.



## Pressurizer Spray Nozzle to Head % of Coverage

## Item No. : C1.B3.110.0002

Weld No.: 1PZR-W2

## Weld Coverage

<u>Scan</u>	Angle	% Coverage Obtained	
<b>S</b> 1	35°	100	
S2	35°	76.1	
<b>S</b> 1	45°	100	
<b>S</b> 2	45°	58.9	
CW	35°	100	
CW	45°	100	
CCW	35°	100	
CCW	45°	<u>100</u>	
	Total	735	•
7	735 ÷ 8 =	<u>91.9</u>	% Coverage
Base Mater	ial Coverage		
<b>S</b> 1	35°,45°&60°	90.5	
CW & CCW	/ 45°&35°	<u>64.5</u>	
	Total	155	
	155 + 2 =	<u>77.5</u>	% Coverage
0º Scan Cov	verage =	<u>75.6</u>	% Coverage

## Aggregate Coverage = Weld + Base Material + $0^{\circ} \div 3$



# Pressurizer Spray Nozzle to Head

## **Total Area Weld & Base Material**

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Item No. :C1.B3.110.0002

Weld No. : 1PZR-W2

Scale 1'' = 2''

Total Weld Area = 3.48 sq. in.

Total Area of Base Material = 3.99 + 4.26 = 8.25 sq. in.

Total Exam Area = 3.99 + 4.26 + 3.48 = 11.73 sq. in. Area = 3.48 sq. in. Surface 2 Nozzle Area = 3.48 sq. in. Area = 3.48 sq. in. Area = 4.26 sq. in. Clad Clad Inspector / Date : M III  $\leq |3|^{56}$ 

# **Pressurizer Spray Nozzle to Head**

# 0° Scan Coverage

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Item No. : C1.B3.110.0002

Weld No. : 1PZR-W2

Scale 1" = 2"

 $0^{\circ}$  Scan Total Area = 8.87 sq. in.

Total 0° Scan Coverage =  $8.87 / 11.73 \times 100 = 75.6 \%$ 


# Pressurizer Spray Nozzle to Head

# **Base Material Coverage - Axial Scans**

ATTACHMENT A PAGE 9 OF 42

Item No. : C1.B3.110.0002

Weld No. : 1PZR-W2

Scale 1'' = 2''

Total Area of Base Material = 3.99 + 3.48 = 7.47 sq. in.

Total Base Material Coverage =  $7.47 / 8.25 \times 100 = 90.5 \%$ 



# <u>Pressurizer Spray Nozzle to Head</u> Weld Coverage - Axial & Circumferential Scans

ATTACHMENT A PAGE 10 DF 42

Item No. : C1.B3.110.0002

Scale 1'' = 2''

Weld No. : 1PZR-W2

100% Coverage 35° & 45° Scans CW, CCW and Axial from Surface 1

Total Weld Coverage 35° from Surface  $2 = 2.65 / 3.48 \times 100 = 76.1 \%$ 

Total Weld Coverage 45° from Surface  $2 = 2.05/3.48 \times 100 = 58.9\%$ 



# <u>Pressurizer Spray Nozzle to Head</u> Base Material Coverage - Circumferential Scans

Item No. : C1.B3.110.0002

Weld No.: 1PZR-W2

Scale 1'' = 2''

Total Area of Base Material = 3.99 + 1.33 = 5.32 sq. in.

Total Base Material Coverage =  $5.32 / 8.25 \times 100 = 64.5 \%$ 



ATTACHMENT A PAGE 12 OF 42



### **UT Vessel Examination**

Site	e/Unit: C	Catawba /	1		Pre	Procedure: NDE-640				Outage No.:	C1-'	17
Summar	y No.: _	C1.B3.110	.0003		Procedu	Ire Rev.:	4			Report No.:	UT-08	-008
Works	scope:	ISI			Work Oi	rder No.:	01756752			Page:	i of	
Code:		1998/2000A		Cat./Item:	<b>B-D/B3</b> .1	110	Location:					
Drawing No.:		CNM 1201.	01-175/1		Description:	Nozzie to He	ad					
System ID:	NC											
Component ID:	1PZR-V	V3					Size/Length:	<u>N/A</u>	T	hickness/Diamete	. 3.00	) / 15.000
Limitations:	Yes - S	ee Limitation Ini	ormation on	Report UT-	08-010		Sta	rt Time:	1429	Finish Time	:	1540
Examination St	urface:	Inside 📋	Outside	2	Surface Cond	lition: GROL	IND					
Lo Location:		9.2.3	Wa	Location:	Centerline of V	<u>Neid</u>	Couplant:	ULTRAG	EL II	Batch No.: _	0	7125
Temp. Tool Mfg	g.:	FISHER		Serial No.:	MCNDE 272	20	Surface Temp.:	69	°F			
Cal. Report No	.:				CAL-08-013							
Angle Used	0	45 45T	60 60T	<b></b>								
Scanning dB	41.8											
Indication(s):	Yes	] No 🗹			Scan Coverage: Up	ostream 🗹	Downstream 🗹	cw	] CC	w 🗹		
Comments:												
Populia	٨٥٥	nt 🗔 🛛 Dele		afa 🗔								
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Percent Of Cov	verage C	)btained > 90%:	<u>NO - 81</u>	.2%		us Data:						
Examiner L	evel II-	N	) Signat		> Date	Reviewer	/	TIL	Sig	nature		Date
Griebel, David	M		<u>m1</u>	7	5/7/2008	Olle Deview	· (	141			5	IIGLOB Data
Examiner L Ellis, Ken	evel ( .	N	Signat	ure '	Late 5/7/2008	N/A		11	210	nature		Date
Other L	evel jj.	N E	Signat	ure	Date 5/7/2008	ANII Review	· .	R	A Sig	nature	S	21.08 Date
Neene, Lougia:	<b></b>	Ca	d f de	cn_	01112000	l		<u>x/x /</u>	- MARINA			
												/K)H 8/H/0

3 OF 42	NDE-91 Revision 5 Page 26 of 26
190	LIMITED EXAMINATION COVERAGE CHECKLIST
4	ISI Summary No: <u>C1. B3.110.0003</u>
ď	(UT) Verify search unit wedge index to nose dimension;
	(UT) Draw the examination volume showing beam paths.
D	(ALL) Draw the examination volume or area with obstructions including dimensions on the Supplemental Report, or if the drawing is too large, attach it to the Supplemental Report; (Marked-up drawings and/or digital photos are acceptable if dimensioned)
Ø	(ALL) Note the scale of the drawing;
Ø	(ALL) Calculate coverage in a detailed and orderly method; Note: Does not apply to hangers, snubbers, restraints or supports
	(ALL) Complete IDDEAL forms: "Limitation Work Sheet" and "Supplemental Report".
ď	(ALL) Check the "Reject" box on the examination data sheet.
<u>. IWS</u>	NDE Level III ME III Date \$ [5] DE
MN	IP NDE Level III Amilia Dire 05/12/08

Figure 13 Limited Examination Coverage Checklist

VERIFY HARD COPY WITH NEDL VERSION IMMEDIATELY PRIOR TO INITIAL USE AND EVERY 14 DAYS THEREAFTER WHILE THE PROCEDURE IS IN USE

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### **UT Vessel Examination**

Sit	e/Unit:	Catawb	a /	1			1	Procedure:	NDE-820				Outage No.:		C1-17	, 
Summa	ry No.:	C	:1.B3.11(	0.0003			Proce	edure Rev.:	2	2			Report No.:	U	IT-08-0	10
Work	scope:		ISI				Work	Order No.:	0175	6752			Page:	_1	of	7
Code:		1998/2	000A			Cat./Item	n: B-D/B	3.110	Locati	ion:						
Drawing No.:		C	NM 1201	.01-175	/1		Description	Nozzie to He	ad							
System ID:	NC	و و المحمول ا														
Component ID:	1PZR	-W3				<u> </u>			Size/Leng	ith:	N/A	- Thi	ickness/Diam	eter:	3.000	/ 15.000
Limitations:	Yes -	Single S	ided Due	to Noz	zle				<u></u>	Start	Time:	1429	Finish T	ime:	11	510
Examination S	urface:	Insi	ide 📋	OL	itside 🔽		Surface Co	ondition: AS G	ROUND						نىيەنىتىنىكى مەنبىيىنىكى	······································
Lo Location:		9.	2.3		_ Wo L	ocation:	Centerline	of Weld	Couplant:		ULTRAGEL	. (1	Batch No	».:	07	125
Temp. Tool Mf	ġ.:	F	ISHER		_ Se	erial No.;	MCNDE 2	7220	Surface Ter	mp.: _	69	_°F				
Cal. Report No	».:					CAL-08	8-014, CAL-08-015,	CAL-08-016								
Angle Used	0	45	45T	60	801	35T	]									
Scanning dB		65.0	66.0	75.4	70.0	70.0	•									
Indication(s):	Yes		lo 🔽				Scan Coverage:	Upstream 🗹	Downstream	m 🗹	cw	CCV	v 🗹			
Comments:																
See attached Previously re	covera corded	age data I ID Geoi	sheets. metry wa	ıs seen,	, but at <del>l</del>	ess than	recordable indicat	tions								
												AL				ale.
Results:	Ac	cept 🔲	Rej	ect 🗹	In	io 📋	Additional Ins	pectors: Josie	Muirhed / K	(en Ell	13- Aut	Mu	ullan	Ž.	-4	<u></u>
Percent Of Co	verage	Obtaine	d > 90%:		No-81.2	%	Reviewed Pre	vious Data:	Yes							
Examiner ( Griebel, David	.evel ( M.	II-N	0	/	Signatur	8	Da 5/7/200	ite Reviewer		C	MAS	Sigr	nature		5	Date
Examiner I	evel		<u> </u>	<i>E</i> : 7 / <	Signatu	e	Da	te Site Review	,		110	Sigr	nature			Date
Stauffer, Leste	r, E.	(	$\leq z$	<u>+</u>	$\geq $		5/7/20	08 N/A				Cim				Date
Other I Keene, Dougla	.evel   Is L.	II-N	E.		Signatur	е -1.	Da 5/7/200	16   AINII KEVIEV 08		Km	antil 1	Jigr			5	<u>ଧ-୦୫</u>

## Pressurizer Safety/Relief Nozzle to Head % of Coverage

Item No. : C1.B3.110.0003

Weld No.: 1PZR-W3

### Weld Coverage

<u>Scan</u>	Angle	<u>% Coverage Obtained</u>	
<b>S</b> 1	35°	100	
S2	35°	82.4	
<b>S</b> 1	45°	100	
<b>S</b> 2	45°	61.4	
CW	35°	100	
CW	45°	100	
CCW	35°	100	
CCW	45°	<u>100</u>	<b>N</b> .
	Total	743.8	
7,	43.8 ÷8 =	<u>93.0</u>	% Coverage
Base Mater	ial Coverage		
<b>S</b> 1	35°,45°&60°	89.3	
CW & CCV	V 45°&35°	<u>63.1</u>	
	Total	152.4	
	152.4 + 2 =	<u>76.2</u>	% Coverage
<u>0° Scan Co</u>	verage =	<u>74.3</u>	% Coverage

## Aggregate Coverage = Weld + Base Material + 0° + 3



# ATTACHMENT A PAGE 16 OF 42

## Pressurizer Safety / Reliet Nozzle to Head Total Area Weld & Base Material

Item No. : C1.B3.110.0003

Weld No. : 1PZR-W3

Total Weld Area = 3.29 sq. in.

Total Area of Base Material = 3.59 + 3.87 = 7.46 sq. in.



Scale 1'' = 2''

# <u>Pressurizer Safety / Relief Nozzle to Head</u> 0° Scan Coverage

ATTACHMENIA PAGE 17 OF 42

Item No. : C1.B3.110.0003

Weld No. : 1PZR-W3

 $0^{\circ}$  Scan Total Area = 7.99 sq. in.

Total 0° Scan Coverage = 7.99 / 10.75 x 100 = 74.3 %

Scale 1" = 2"



# <u>Pressurizer Safety / Relief Nozzle to Head</u> Base Material Coverage - Axial Scans

ATTACHMENT A PAGE 18 OF 42

Item No. : C1.B3.110.0003

Weld No. : 1PZR-W3

Scale 1" = 2"





### ATTACHMENT A PAGE 19 OF 42

# <u>Pressurizer Safety / Relief Nozzle to Head</u> Weld Coverage - Axial & Circumferential Scans

Item No. : C1.B3.110.0003

Scale 1'' = 2''

Weld No.: 1PZR-W3

100% Coverage 35° & 45° Scans CW, CCW ans Axial from Surface 1 Total Weld Coverage 35° from Surface  $2 = 2.71 / 3.29 \times 100 = 82.4\%$ 

Total Weld Coverage 45° from Surface  $2 = 2.02 / 3.29 \times 100 = 61.4\%$ 



### ATTACHMENT A PAGE ZO OF 42

## Pressurizer Safety / Relief Nozzle to Head

## **Base Material Coverage - Circumferential Scans**

### Item No. : C1.B3.110.0003

Weld No.: 1PZR-W3

Scale 1'' = 2''

Total Area of Base Material = 3.59 + 1.12 = 4.71 sq. in.

Total Base Material Scan Coverage =  $4.71 / 7.46 \times 100 = 63.1 \%$ 



ATTACHMENT A Page 21 of 42



### **UT Vessel Examination**

Site/	Unit: C	atawba	/	1			Procedure:	NDE-363	0	C	Dutage No.:	C1-17	•
Summary	No.: _	<u>C1</u>	.C1.20	.0003			Procedure Rev.:	1		1	Report No.:	UT-08-0	54
Worksc	ope: _		ISI				Work Order No.:	0175674	1		Page: 1	of	7
Code:		1998/200	A		(	Cat./Item	:C-A/C1,20	Location:					
Drawing No.:		CN	ISIN3-	1554-1.0	)		Description: Head to Fla	inge					
System ID: N	<u>IV</u>						······································						
Component ID: 1	ELDH)	(-HD-FLC	3				······	Size/Length:	N/A	Thic	kness/Diameter	0.750	/ 9.500
Limitations: Y	'es - Se	e Attaci	ned Lin	nitation	Calculat	ions		Sta	art Time:	0946	Finish Time	10	20
Examination Sur	face:	Inside	• []	Ou	side 🖌		Surface Condition: AS	GROUND					
Lo Location:		RT #	H		Wo Lo	ocation:	Centerline of Weld	Couplant:	ULTRAG	EL N	Batch No.: _	07	25
Temp. Tool Mfg.	:	FIS	HER		Se	ial No.;	MCNDE32768	Surface Temp.:	72	°F			
Cal. Report No.:				- T.C. 7	CAL	08-071, 0	CAL-08-072, CAL-08-073, CAL-0	/ 8-074					
Angle Used	0	45	45T	_60~	_60T	45L							
Scanning dB		45.1	50.1	58.2 *	60	60 •							
Indication(s):	Yes 🛃	j No					Scan Coverage: Upstream	Downstream 🗹	cw	CCW			
Comments:													
* Reduced scar	nning d	iB to obt	ain 2:1	signal (	o noise	ratio.							
Results:	Acce	ept 📋	Reje	et 🔽	Info								
Percent Of Cove	erage O	btained >	<b>90%</b> :		o <u>- 30.6</u> %	<u>/a</u>	Reviewed Previous Data:	<u></u>					
Examiner Le Eaton, Jay A.	vel    .	N (	T		Signature	;	Date Reviewer 5/22/2008	DELhipe	t	Signa	ilure	5/2	7/18
Examiner Les Stauffer, Lester,	vei 111. E.	N	P	2	Signature	1	Date Site Revie 5/22/2008 N/A	w		Signa	Iture		7 Date
Other Lev N/A	vel N/	A (		ę	Signature	)	Date ANII Revie 5/22/2008	W	Rm	) Signa	lture	5.28	Date -US
									- )			AJ	H 8/11/02

ATTACHMENI H PAGE 22 OF 42

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		S	Sile/Ur		awba		4 20 00	1	······	P	roceaun	e: 	NDE-	3630		Outage No.:		<u>C1-17</u>	, 	
		JUI	nnary N Vorkecor	0 		1.1	191	03		Mode	Jule Rev Detec Me	···				Кероп №.:		<u>08-0</u>	54	
		•					131				Jraer No		U1/5	5/41		Page:	2	of		
	Sea	rch Unit Ar	gle:	45			0			() Pi	ping Wei	ds						Wo Cl	Wmex	
		Wo Loca	tion:	CL of W	eld	<u></u>				() Fe	erritic Ve	ssels <u>&gt;</u>	2"T					<u>+</u>		
		Lo Locat	tion:	<u>RT.</u> #	1					⊚ Ot	her	Vessel	<u>&lt; 2"T</u>					 	.]]	]
ſ	MP	Metal F	ath				Wn	nax D	istance l	From Wo	To S.U.	At Maxir	num Rei	sponse	7					J
	RBR	Remain	ning Bacl	k Reflectio	n		W1	0	listance l	From Wo	At	Of	Max (Fo	ward)				1	Lo	
Į	L Com	Distanc	e From I	Datum			W2	2 D	listance I	From Wa	At	Of	Max (Fo	orward)				H The second sec		
																	-+-	 	WI Winax W	2
S	can	Indication	%	1	N		For	ward	Bad	kward	11	L	12	RBR	1	Ţ	Remark	s		
	#	No.	Of DAC	<u> </u>	fax L Mr	_	1874	Of Max	1400	Of Max	Of	Мәх	Of	Атр.						I
	4		200%	1-1 6	1 3	,	N/A	N/A	N/A	N/A	N/A	CL+1"	N/A	NIA	Geometry			·····		
┢	3		200%	1-2.9	1.2	3	N/A	N/A	N/A	N/A	N/A	CL+1"	N/A	N/A	Geometry					
-						-										····				
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Eato	miner on. Ja	Level V A.	11 <b>1-N</b>			Ľ	Signatur	e		5/22/2	008	lewel (	DE	How	Sen	oighat			5/27/0	7
Exa	miner	Level	III-N			15	jgnatur	e		D	Date Site	Review			<u> </u>	Signat	ure			Date
Star	iffer,	Lester, E.		$- \subset$		×	$\geq$			5/22/2	008 N//	<u>ا</u>		~						<u>.</u>
Oth	Br	Level	N/A	C		S	Signatur	e		0 ירוכרום	ate ANI	l Review	X		An	Signati	ure		C-28 x	
N/A	<b>L</b>									JIGAL			<u></u> D.\	L LY	<u>wv</u>				3000	9

## **Ultrasonic Indication Report**

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ATTACHMENT A PAGE 23 OF 42



# ATTACHMENT A PAGE 24 OF 42

DUKE ENERGY COMPANY										
ISI LIMITATION REPORT										
Summary #:	Component ID 1ELDHX-HD-FLG	remarks:								
NO SCAN	SURFACE BEAM DIRECTION	Nozzle Connection								
LIMITED SCAN	□ 1 ⊠ 2 ⊠ 1 □ 2 ⊠ cw ⊠ ccw									
FROM L _26.0" to L _ 30.0"	INCHES FROM WO + 0.5 to Beyond									
ANGLE: 0 🛛 45 🗌 60	other <u>70°</u> FROM DEG to DEG									
NO SCAN	SURFACE BEAM DIRECTION	Nozzle Connection								
LIMITED SCAN	□ 1 ⊠ 2 ⊠ 1 □ 2 ⊠ cw ⊠ ccw									
FROM L to L	INCHES FROM WO + 0.5 to Beyone									
ANGLE: 0 0 45 60	other <u>70°</u> FROM DEG to DEG									
NO SCAN	SURFACE BEAM DIRECTION	Nozzle Connection								
LIMITED SCAN	□ 1 ⊠ 2 ⊠ 1 □ 2 ⊠ cw ⊠ ccw									
FROM L _11.0" to L16.0"	INCHES FROM W0 + 0.5 to Beyond									
ANGLE: 0 0 45 60	other <u>70°</u> FROM DEG to DEG									
NO SCAN	SURFACE BEAM DIRECTION	Nozzle Connection								
LIMITED SCAN	🗌 1 🛛 2 🖾 1 🗌 2 🖾 cw 🖾 ccw									
FROM L 16.0" to L 19.5"	INCHES FROM W0 + 0.5 to Beyond	Sketch(s) attached								
ANGLE: 0 0 45 00	other <u>70°</u> FROM DEG to DEG	🛛 yes 🗌 No								
Prepared By: Jay Eaton	Level: III Date: 05/22/2008 She	et <u>4</u> of <u>7</u>								
Reviewed By: DE Howen	Date: 5/27/08 Authorized Inspector.	Date: 5-28-08								

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### % Coverage Calculations

### item No. : C1.C1.20.0003

Weld No. : 1ELDHX-HD-FLG

HX Ø = 9.5"

"t" = 0.750"

Weld Length = 30"

Limited a total of 15" due to 4 nozzles =  $15 / 30 \times 100 = 50\%$  of the weld legth

### **Aggregate Coverage Calculation**

### **Axial Scans**

At 4 - Nozzles	0 %	( 50% of the L	ength x 0% of the Volume) 👌
Remaining Length	<u>29.7</u> %	( 50% of the L	ength x 59.4% of the Volume)
Total	29.7 %	·	
Circ. Scans			
At 4 - Nozzles	13.2 %	( 50% of the L	ength x 26.4% of the Volume)
Remaining Length	<u>18.2</u> %	( 50% of the L	ength x 36.3% of the Volume)
Total	31.4 %		
Total =	61.1 ÷ 2 =	<u>30.6%</u>	Aggregate Coverage

TIL STUDB Page 5 of 7 Inspector / Date:

Summary No. C1.C1.20.0003

ATTACHNENT PAGE 26 OF 42

Scale : 1" = 1"





% Coverage in the Circ. direction =  $(0.173 + 0.344 + 0.118) / 1.75 \times 100 = 36.3\%$ 



Circ. Coverage for 50% of the weld length due to Nozzles @4 locations

% Coverage in the Circ. direction =  $(0.344 + 0.118) / 1.75 \times 100 = 26.4\%$ 



Summary No. C1.C1.20.0003





Axial Scan 45° Shear (ID/OD/ID Calibration)

% Coverage from S2 with Shear waves =  $0.786 / 1.75 \times 100 = 44.9\%$ 



% Coverage From S2 with 70° RL =  $0.253 / 1.75 \times 100 = 14.5\%$ 

Total % Coverage From S2 with 70° RL and 45° shear = 14.5% + 44.9% = 59.4%

ATTACHMENT A PAGE 27 OF 42

ATTACHMENT A Page 28 of 42	NDE-91 Revision 5 Page 26 of 26 LIMITED EXAMINATION COVERAGE CHECKLIST ISI Summary No: <u>C1.C1.ZO.000</u> 3
	(UT) Verify search unit wedge index to nose dimension;
	(UT) Draw the examination volume showing beam paths.
	(ALL) Draw the examination volume or area with obstructions including dimensions on the Supplemental Report, or if the drawing is too large, attach it to the Supplemental Report; (Marked-up drawings and/or digital photos are acceptable if dimensioned)
	(ALL) Note the scale of the drawing;
	(ALL) Calculate coverage in a detailed and orderly method; Note: Does not apply to hangers, snubbers, restraints or supports
	(ALL) Complete IDDEAL forms: "Limitation Work Sheet" and "Supplemental Report".
	(ALL) Check the "Reject" box on the examination data sheet.
	IWS NDE Level III MALS III Date 5/22/08
	MMP NDE Level III Duvic X B Date 5/27/08
	Figure 13 Limited Examination Coverage Checklist

#### VERIFY HARD COPY WITH NEDL VERSION IMMEDIATELY PRIOR TO INITIAL USE AND EVERY 14 DAYS THEREAFTER WHILE THE PROCEDURE IS IN USE

BR	<b>.</b>					ł	UT Vessel Ex	aminati	on						A ] P A	1ACH 6e29	MENT A OF 42
Si	te/Unit:	Catawba	n /	1			Pn	ocedure:	NDE-	3630			Outa	ge No.:		C1-17	
Summa	iry No.:		1.C1.20	.0019			Procedu	ure Rev.;	1				Rep	ort No.:	U	T-08-03	
Work	(scope:		ISI				Work O	rder No.:	0175	6742				Page:	1	of	<u>جا ک</u> ج
Code:		1998/20	A000			Cat./Item	: <b>C-A/C1</b>	.20	Locat	ion:						9t	5/15/08
Drawing No.:		C	N-ISIN3-	1554-1.	1	ي الكريب علي الم	Description:	Lower Head	to Shell								
System ID:	NV																
Component ID:	1VCT	LH-SH					······		Size/Leng	th:	N/A	·	Thickne	ss/Diam	eter: _	0.250/	0.000
Limitations:	Yes -	See Attac	ched Lin	nitation	Report			······································		Start	Time:	1025	<u> </u>	Finish T	ime: _	11	15
Examination S	Surface:	Insi 9.1	de 🗍 2.1	Ou	tside 🗹 Wo L	ocation:	Surface Conc Concerning of Fly	sition: <u>GRO</u> LD wheet QL	SVIS D6 Couplant:		ULTRAG	EL 11	E	Batch No	.:	071	25
Temp. Tool M	fg.:	FI	SHER		_ Se	rial No.:	MCNDE 272	19	Surface Ter	np.: _	87	°F					
Cal. Report N	o.:						CAL-08-052				·····						
Angle Used	0	45	45T	60	60T												
Scanning dB		61.8	61.8														
Indication(s):	Yes	No No					Scan Coverage: U	ostream 🗹	Downstream	n 🖌	cw₽	] C	cw				
Comments:																	
Results:	Ac	cept 🔲	Reje	ect 🗹	Inf	• 🗆											
Percent Of Co	overage	Obtained	> 90%:	!	<u>10 - 89,4</u>	<u>%</u>	Reviewed Previo	us Data:	Yes Yes								
Examiner Leeper, Winfre	Level   ed C.		10.11	20	Signatur	3	Date 5/14/2008	Reviewer		7	ME	>	ignature	)		5 1	Date 5 <b>DB</b>
Examiner Mulrhead, Jos	Level ( le	I-N	in in	Mul	Signatur	9	Date 5/14/2008	Site Review	1			S	ignature	}			Date
Other I N/A	Level	NIA /	je ji de dijem		Signatur	9	Date 5/14/2008	ANII Review	v		Rm	Lul S	ignature	,		s.S	Date
											1		,			115	111

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ATTACHMENT A PAGE 30 OF 42

## **Ultrasonic Indication Report**

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		1 <b>1 1 1 1 1 1 1 1</b> 1	Site/Unit	: Cat	awba	1	1		P	rocedure	e:	NDE-3630		Outage No.:		.: C1-17			
		Su	mmary No.	:	C1	.C1.20.00	119		Proced	ture Rev		1		Repo	rt No.:	UT	-08-0	31	
_	والبر الموالي المراجع	1	Workscope	:		ISI			Work (	Order No	.:	01756	5742		Page:	2	of	860	k slisloo
	Sea	wo Loca Lo Loca	ngie: tion: tion:	45 C 9.2.1					<ul><li>○ Pij</li><li>○ Fe</li><li>③ Ot</li></ul>	ping Wel erritic Ves ther	lds ssels <u>&gt;</u> Vessel	2"T < 2"T		ſ			No L	Wina Wi Vi	R 72
	MP Metal Path RBR Remaining Back L Distance From Da Comments:			Reflectio	n	Wr W1 W2	nax (   ( 	Distance   Distance   Distance	From Wa From Wa From Wa	) To S.U. ) At ) At	At Maxi Of Of	mum Res Max (Fo Max (Fo	sponse rward) rward)						
ſ	Scan #	Indication No.	% Of DAC	N	W Max MP	For W1	ward Of Max MP	Bad (	kward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.		F	Remarks	<u>;</u>		
t	52	1	40%	.20	.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Geometry - 360° I	NT.				
	aminer eper, V	Level Vinfred C.	II-N II-N	Jing		Signatur Signatur	e		D 5/14/24	Date Rev 008 Date Site	fiewer Review			AAA AAA	Signati				Date
Mi	Irhead	, Josle		Jos	ù_l	Jula	d		5/14/2	008 N//					Cimel			<u> </u>	Data
Ot N/	ner A	Level	N/A	/		Signatur	e 		5/14/2	008		····		Loleet	M4	fil		5	20-CB

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PAGE 3	1 O F	42

	1	Sunnlementa						
	2	ouppremente	in report	Report No.:	UT-08-031			
	-				Page:	3	of <u>56</u>	
Summary No.:	C1.C1.20.0019			$\wedge$			5/15/08	
Examiner:	Leeper, Winfred C. Win and Lever	Level: II-N	Reviewer:	$\Box$	WHS II	Date:	5/15/00	
Examiner:	Muirhead, Josie Tores August	Level: II-N	Site Review:	N/A		Date:		
Other:	N/A	Level: N/A	ANII Review:	<b>R</b> n	nyu	Date:	;2008	
				· · · ·	-			

Comments: indication #1 - 45°- 360° INT, is geometrical weld root indication caused by beam redirection.

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



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<b>Determination of Percent Coverage</b>	for
UT Examinations - Vessels	

A 6	Site/Unit:	Catawba /	1	Proc	edure:	NDE-3630	Outage No	.: <u>C1-17</u>
Sum	mary No.: _	C1.C1.2	0.0019	Procedure	Rev.:	1	Report No	UT-08-03
	orkscope:	1SI		Work Orde	er No.:	01756742	Pag	e: <u>4</u> of
								of
	Scan		% Length X		% volun	ne of length / 100 = _		% total for 0 de
	40 deg Scan 1	1 89.400	% Length X	100.000	% volum	ne of length / 100 = _	89,400	% total for Sca
	Scan 2	289.400	% Length X	100.000	% volum	ne of length / 100 = _	89.400	% total for Sca
	Scan :	3 89.400	_% Length X _	100.000	% volum	ne of length / 100 = _	89.400	% total for Sca
	Scan 4	489.400	_% Length X _	100.000	% volum	ne of length / 100 = _	89.400	% total for Sca
	Add	totals and divide	by#scans =	89.400	% total for	r 45 deg		
	<u>Other de</u>	<u></u>	-					
	Scan 1	I	% Length X _		% volun	ne of length / 100 = _		% total for Sca
	Scan 2	2	_% Length X _		% volum	ne of length / 100 = _		% total for Sca
	Scan 3		% Length X		% volun	ne of length / $100 = -$	<u>-</u>	% total for Sca

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

89.400 % Total for complete exam

Note:

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

TT

Date: 5 14 08

Site Field Supervisor:

### ATTACHMENT A PAGE 33 OF 42

\_ \_

DUKE ENERGY COMPANY												
ISI LIMITATION REPORT												
Summary #: <u>C1.C1.20.0019</u>	remarks:											
	SURFACE	BEAM DIRECTION	1	7 1/2" at 4 support leg								
LIMITED SCAN	⊠ 1 ⊠ 2	🛛 1 🖂 2 🖾 cw	🛛 ccw	@ 45°, 135°, 225° and 315°								
FROM L <u>*</u> to L <u>*</u>	INCH	IES FROM WO _CL to	Beyonod									
ANGLE: 0 🛛 45 🗍 60	other	FROM DEG to _	DEG	% of weld not examined								
NO SCAN	SURFACE	BEAM DIRECTION	J	= 7.5" X 4 = 30"								
LIMITED SCAN		🗌 1 🗌 2 🗌 cw	Ccw	Total weld length = 283"								
FROM L to L		% examined =(283-30) / 283x100										
ANGLE: 0 0 45 0 60	other	FROM DEG to	DEG	= 89.4%								
	SÚRFACE	BEAM DIRECTION	1									
LIMITED SCAN		🗌 1 🗌 2 🗌 cw	🗌 ccw									
FROM L to L	INCH	IES FROM WO to										
ANGLE: 0 0 45 60	other	FROM DEG to	DEG									
NO SCAN	SURFACE	BEAM DIRECTION	1									
LIMITED SCAN		1 2 C cw	🗌 ccw									
FROM L to L	INCH	IES FROM W0 to		Sketch(s) attached								
ANGLE: 0 0 45 60	other	FROM DEG to	DEG	🗋 yes 🛛 No								
Prepared By: Winfred Leeper	Level:	II Date: 05/14/2008	Shee	t <u>5</u> of <u>6</u>								
Reviewed By:	Date:	SISOB Authorized Inspection	maril	Date: 5.20-08								
			<b></b>	t								

		PAGE 34 DE 42-
LI TRASONIC REAM AI	NGLE MEASUREMENT RECORD	
	1. Take thickne wedge locati	ess measurements between ons.
	2. Place search pipe, and pe	unit on straight run of ak the signal.
	3. Measure dis points.	ance (d) between exit
$\tan \phi = \frac{(d/2)}{t}$	4. Calculate be as shown us thickness.	am angle with formula ing measured wall
	5. Use the mean determine cover states of the second secon	sured beam angle to erage and when indications.
For thin wall pipe use 2nd Vee path tan $\phi = (d/2)$	Pipe size: <u>_</u> Pipe Schedule:	$10^{-10^{-10^{-10^{-10^{-10^{-10^{-10^{$
2t Nominal 45 deg: d=	0.8; t=_0.385; measured angle=_46.0	<u>9_deg</u>
Nominal 60 deg: d=	t=; t=; measured angle=	i_deg
Nominal 70 deg: d=	; t=; measured angle=;	_deg PALE 6 OF 6
Examiner , Level Winflahr Respondent T	Date Examiner - 5.14.08. Audal	Level Date <u>ZC 5/14/08</u>
Reviewed By Level	Date Authorized Inspector	Date S:20-08
1		1

LIMITED EXAMINATION COVERAGE CHECKLIST ISI Summary No: CIRI. To . OOIG

### (UT) Verify search unit wedge index to nose dimension:

(101) Diawahe examination volume showing beam paths. (A14) (Pinyans examination valume or area with obstructions including dimensions of 1 the Supplignental Report, or if are discourges too large, super lighting Supplemental Report Addressing instances and a complemental process are successed in this supplementation of the supplementation of t E I (ALL) More the scale of the drawing

ALL, Dalouble coverage in a recall shand orderly method; Note: These and Apply to bangers, single cristraints or supports TAILS Complicated DEAL forms "Ismumon Work Sheet" and "Supplemental Report 122 (ALL) Close in Rejoct box on the samination data sheet. 

IWSNDELEVELIU

MMP NDE LEVELTI

PAGE35 DF ATTACHMEN

Rigune 13 Islimited Runnlingtion Coverage Coversitist

Date

Date

 $D)_{G}$ 

ALT OF OF

ATTACHMENI A PAGE 36 OF 42



## UT Pipe Weld Examination

Site/Unit: Catawba		Catawba	1	_1			Pr	ocedure:	NDE-	500			Outage	No.:		C1-17	
		C	1.C5.21.	0002	Procedure Rev.:				17			Report No.:			U	UT-08-023	
Workscope: ISI					Work O	rder No.:	01756	732			Pa	age: _	1	of			
Code:		1998/200	0A		C:	at./item:	C-F-1/C	5.21	Locatio	on:							
Drawing No.:		CI	N-1NI-11				Description:	Elbow to 1	ée								
System ID:		~				·		<u></u>	Circ# cretb.								
	<u></u>	<b>y</b>				·			- Size/Length:			If	IICKINESS/L		(er:	0.531 / 4.	000
	Yes - :		ea Limi	tation	кероп						ime;	0935	Fin	isn i in	ne:	1020	
Examination S	Surface:	Inside	• 🗆	Ou	tside 🖌		Surface Con	dition: AS	GROUND								
Lo Location:	<u></u>	9.1.1	.1		Wo Locati	ion:	Centerline of	Weld	Couplant:	<u>(</u>	LTRAG		Bate	h Ņo.:	:	0712	<u>;</u>
Temp. Tool M	fg.:	FIS	HER		Serial N	1o.:	MCNDE 272	220	Surface Tem	ıp.:	68	_*F					
Cal. Report N	o.:			C/	AL-08-041, C	AL-08-04	2, CAL-08-043	·									
Angle Used	0	45	45T	60	60L												
Scanning dB			45.0	45.0	50												
Indication(s):	Yes	No				Sca	n Coverage: U	pstream 🗹	Downstream		cw	CC	W				
Comments:																	
FC 08-03																	
Results:	Accept [	Rej	ject 🔽		info 📋												
Percent Of Co	verage (	Obtained >	90%:		0 - 77.0%		Reviewed Previo	us Data:	Y Yes			<u></u>					
Examiner	Level 1	II-N	7		Signature		Date	Reviewer	H IM			Sig	inature			11.	Date
Eaton, Jay A.	lovol t		4	WS	Signature		5/12/2008	Site Revie	Jan // / 10	3		Sic	inature		5	118108	Date
Ellis, Ken	20101 1	1-14			Els.	•	5/12/2008	N/A	" "/								
Other N/A	Level	1/A			Signature		Date 5/12/2008	ANII Revi	9W		R	Sig Sig	nature		٢٠	21.08	Date
,		<u></u>					- <u></u>				Y	- روهها.				ЛЛН	club



Note:  $60^{\circ}$  RL scan not included in percentage coverage due to requirements of 10CFR50.55a(b)(2)(xv)(A)(1). Best effort scan with  $60^{\circ}$  RL obtained 13.1% coverage in one axial direction.



ATTACHMENT A PAGE 37 OF 42



Side View - Not to Scale



Plan View - Not to Scale



ATTACHMENT A PAGE 38 OF 42 TT 5/13/08 Page 3 of 6 Inspector / Date :

Scale : 1'' = 1''



### Circ. Scan limitation due to adjacent pipe

Total inspection volume = 2.3 sq. in. x 1.1" x 1.8" = 2.3 cu. in. Volume not examined = 0.16 sq. in. x 1.1" = 0.18 cu. in. Total volume examined circ. scan from Surface 1 = 100 - (0.18 / 2.3 x 100) = 92.2%.



Scale : 1'' = 1''



Note:  $60^{\circ}$  RL scan not included in percentage coverage due to requirements of 10CFR50.55a(b)(2)(xv)(A)(1). Best effort scan with  $60^{\circ}$  RL obtained 12.1% coverage in one axial direction.

Limited due to adjacent pipe on the surface 1 side of the weld. Limited area from Lo + 6.1" to Lo + 8.1".

ATTACHMEN. A PAGE 40 OF 42 III 5/13/08 Page 5 of 6 Inspector / Date :

### % Coverage Calculations

#### Item No. : C1.C5.21.0002

#### Weld No. : 1NI11-9

Pipe Ø = 4.5"

"t" = 0.531"

Weld Length = 14.2"

Limited scan on Surface 2 due to the throat of the tee for 6" of the weld length .

Limited scan on Surface 1 due to adjacent pipe for 2" of the weld length .

% of Length at throat of Tee =  $6 / 14.2 \times 100 = 42.2\%$ .

% of Length atadjacent pipe =  $2 / 14.2 \times 100 = 14.1\%$ .

% of Length examined 100% = 100 - 14.1 - 42.2 = 43.7%.

#### Aggregate Coverage Calculation

S1 = Pipe	43.7 %	(43.7% of the Length x 100% of the Volume)
S1 = Pipe	21.1 %	(42.2% of the Length x 50% of the Volume)
S1 = Pipe	<u>0</u> %	(14.1% of the Length x 0% of the Volume)
Total S1	64.8 %	
S2 = Tee	43.7 %	( 43.7% of the Length x 100% of the Volume )
S2 = Tee	0 %	( 42.2% of the Length x 0% of the Volume )
	<u>7.1</u> %	(14.1% of the Length x 50% of the Volume)
Total S2	50.8 %	
S1 S3 & S4	92.2 %	(92.2% of the Volume)
S2 S3 & S4	100 %	( 100% of the Volume )

Total = 307.8 ÷ 4 =

 $7.8 \div 4 = 77.0\%$ 

Aggregate Coverage

Page 4 of 4 II 5/13/08 Inspector / Date:

NDE-91 Revision 5 Page 26 of 26

#### LIMITED EXAMINATION COVERAGE CHECKLIST

ISI Summary No: <u>C1. C5. 21. 0002</u>

(UT) Verify search unit wedge index to nose dimension;

(UT) Draw the examination volume showing beam paths.

(ALL) Draw the examination volume or area with obstructions including dimensions on the Supplemental Report, or if the drawing is too large, attach it to the Supplemental Report; (Marked-up drawings and/or digital photos are acceptable if dimensioned)

(ALL) Note the scale of the drawing;

ব

(ALL) Calculate coverage in a detailed and orderly method; Note: Does not apply to hangers, snubbers, restraints or supports

(ALL) Complete IDDEAL forms: "Limitation Work Sheet" and "Supplemental Report".

(ALL) Check the "Reject" box on the examination data sheet.

Date 5113128 **IWS NDE Level III** 5-14-08 MMP NDE Level III Date

Figure 13 Limited Examination Coverage Checklist

ABE 42 OF 45

VERIFY HARD COPY WITH NEDL VERSION IMMEDIATELY PRIOR TO INITIAL USE AND EVERY 14 DAYS THEREAFTER WHILE THE PROCEDURE IS IN USE

### Attachment B

Unit 1 EOC 18 Examination Data

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	<b>Diad</b> co
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### UT Vessel Examination

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ATTACHMENT B PAGE L. OF 31

Site/Unit: Summary No.:		Catawba / 1 C1.C1.30.0008			1 Procedure:   108 Procedure Rev.:			vocedure: lure Rev.:	NDE-363	10	Outage Report	C1-18 UT-09-283		
Works	Workscope:		IS	l			Work C	Order No.:	0186358	4	\$	Page: 1	of	5
Code: Drawing No.:	NS	1998/2( C	DOOA N-ISIN3-	-1563-'	1.0	Cat./Iten	n: C-A/C Description:	1.30 Tubesheet t	Location: o Shell					
Component ID: Limitations:	1BNSH Yes, se	S BNSHX-2B-51C es, see attached limitation sheet							Size/Length: N/A Start Time:		Thickness/ 1300 Fir	Diameter: hish Time:	0.50	0.0/SS 430
Examination SL Lo Location: Temp. Tool Mfg Cal. Report No. Angle Used Scanning dB Indication(s):	urface:	Insi C/L of M 45 3 No	de [] Manway Fluke - 45T	60 54.9	0utside Wo L Se 60T 56.1	ocation: erial No.: 60RL 69.5	Surface Con Centerline of OCQUA330 CAL-09-322, 323, 3 CAL-09-322, 323, 3	dition: <u>AS W</u> Weld 190 24 pstream []	ELDED Couplant: Surface Temp.: Downstream 🖌	ULTRAGE 74 CW 2	L II Bate °F 	ch No.: _	07	125
Comments: 60°RL scanned Results: Percent Of Cove	d with 6 Acce erage O	9.5 dB ( pt [] btained	due to s Reje > 90%:	ignal ( ect 🔽	to noise r Inf	atio.	Reviewed Previo	bus Data:	Yes					
Examiner Le Ransom, Greg	evel ۱۱-۱ کر .ل	Y de	× 74	Zun	Signatur	s 	Date 12/5/2009	Reviewer	Etmo	Qe	Signature	١,	2. 13.	Date 09
Examiner Le Dean, Steven Other Le Day, John, C.	vel II-N		Alen 61	de NL	Signatur	e	Date 12/5/2009 Date 12/5/2009	Site Review			Signature Signature			Date Date
ATTACHMENT B PAGE 2 OF 31

# Ultrasonic Indication Report

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						U	ltraso	onic l	ndica	tion F	Repoi	rt				1 4 9 2	6 113
		Site/Un	it <u>Ca</u>	lawba	1	1		I	Procedur	'e:	NDE	-3630		Outage No.:	C	1-18	
	Su	mmary No	.:	C1.	.C1.30.0	800		Proce	dure Rev	/.:		1		Report No.:	UT-	09-28:	3
		Workscope	»: 		ISI			Work	Order No	».: 	0186	53584		Page:	2	of	5
Sea	arch Unit A	nale:	60 She	ear	0				inina We	lds					W C	То Т	Wmax
	Woloca	tion: Cer	tecline	of Weld	•				erritic Ve	ssels 2	2'T				Ī		W1 W2
		tion:	0°	or were	-				onnio vo Ither	Vessel	 <2"T			[	<u> </u>	$\sum$	₩
					•										<u> </u>		<u> </u>
MP	Metal I	Path			W	max C	Distance	From W	o To S.U	. At Maxi	mum Re	sponse					
RBF	R Remai	ning Back	Reflectio	n	W	1 C	Distance	From W	o At	0	f Max (Fo	(brewio		1 1 1		***	DATUM Lo
L	Distan	ce From Da	atum		w:	2 [	)istance	From W	o At	0	f Max (Fo	orward)				<u> </u>	
					···· <del>·</del> ——			<b>:</b>						12		έ	
Con	ments: I	=C 09-01, (	09-05											1 1			
***	Indication	%	1	W	Fo	rward	Bac	kward	L1	L	12	RBR	1	Ŕ	emarks		
ngle	No.	Of	<u> </u>	Max		Of Max		Of Max	or	Мах	or	Amp.					
		DAC	- W	MP	W1	MP	WZ	MP	Max	E 4 14	Max		Commetein	······			
		224	1.0	1.25			N/A		300				Geometric	, 			
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niner	Level	11-N	100	74	Signatur	•		D	ate Site	Review	<u>~</u>			Signatu	re		0
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r • • •	Level	II-N		5	Signatur	$\Delta a$		D	ate   ANII	Review	/		<u></u>	Signatu	re		D
John	, C.					YY_		12/5/20	ina [		fam.	TK A	b.T.	12-19	6-09		

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DÈ.	Supplemental Report	ATTACHMENT B PAGE 3. OF 3/ Report No.: UT-09-283
Summary No.: C1.C1.30.0008 Examiner: Ransom, Greg J. Mary Row Examiner: Dean, Steven Muse Other: Day, John, C. Mary	Level: II-N Reviewer: DELfrom Level: <u>II-N</u> Site Review: Level: <u>II-N</u> ANII Review: <u>Berneth</u> Chart	Page: <u>3</u> of <u>5</u> Date: <u>12.13.01</u> Date: Date: <u>12.19.09</u>
Comments: Ind. #1 is a geometric reflector due to	o Tube Sheet. Condition was verified by plotting as shown below.	
Sketch or Photo: Z:\UT\IDDEAL\ProfileLine2.jp	9	
· •		
shell S-+ SZ X Slidos	Tube sheet 5251	
•••	ye 5/ 10/05	

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DI	KE POWER COMPANY	
]	ISI LIMITATION REPORT	1 · · · ·
Component/Weid ID: 1BNSHX-2	B-51C Item No: <u>C1.C1.30.0008</u>	remarks:
NO SCAN	SURFACE BEAM DIRECTION	Tube sheet config.
	🛛 1 🗋 2 💭 1 🖾 2 🖾 cw 🖾 ccw	
FROM L N/A to L N/A	INCHES FROM WO CL to Beyond	
ANGLE: 0 45 8 60	other FROM 0 DEG to 360DEG	
X NO SCAN	SURFACE BEAM DIRECTION	Nozzie. 3.9% IZI
LIMITED SCAN	□ 1 ⊠ 2 ⊠ 1 □ 2 ⊠ cw ⊠ ccw	Nozzle within 3.3% of exam
FROM 1 0-5.7" to L 0-11.9	NCHES FROM W0 +0.5" to Bevond	tength. Total weld length
ANGLE: 0 0 45 🛛 60	other FROM N/A DEG to N/A DEG	at-187.0" 157.1" DEC 12/13/09
	SURFACE BEAM DIRECTION	
LIMITED SCAN		
FROM L to L	INCHES FROM WO	
ANGLE: 0 0 45 0 60	other FROM DEG to DEG	
NO SCAN	SURFACE BEAM DIRECTION	
LIMITED SCAN	□ 1 □ 2 1 1 □ 2 □ cw □ ccw	
FROM L to L	INCHES FROM WO	Sketch(s) attached
ANGLE: 0 0 5 0 60	other FROM DEG to DEG	🛛 yes 🗌 No
Prepared By: Gregory Banson Que.	Dete: 11 Dete: 12/05/09 Shee	t <u>4</u> of <u>5</u>
Reviewed By: ALI	Date: 12-13-09 Authorized Inspector.	Date:

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### 12/14/2009 MON 14:16 FAX 8037013463 CNS Tool Repair



Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit: Summary No.:	ci.ci.3	1	Proced Procedure 6	ture: Rev.:	NDE-3630	Outage No	·	C1-16	<u>B</u>
Workscops:	191		Work Order	No.:	01863584	Pag	** *:	of	
<u>0 den Plan</u>	<u>er</u>								
Scen		% Length X		_ % volume a	f length / 100 =		% total	tor 0 d	leg
<u>45 dec</u>		·					:		
Scan 1		% Length X		% volume o	f lerigth / 100 = _		% total	for Sci	an '
Scan 2°_		% Length X		% volume a	f length / 100 = _		% total	for Sci	an :
Scan 3		_ % Length X _	·	% volume a	f length / 100 =		% total	tor Sci	an :
Scan 4		_% Length X _	••••••	% volume o	$f \log h / 100 \approx$		% total	for Sci	aņ (
Add tot	als and divide	by#ecans =.		i total for 45	deg				
<u>Other dea</u>	60	<b>.</b> .							
Scan 1	100,000	% Length X	0.000	% volume o	f length / 100 = _	0.000	% total	for Sci	an
Scan 2 _	96.700	% Length X	21,400	% volume o	f length / 100 = _	20.594	% total	for Sci	an :
Scan 3 _	96.700	_% Length X _	47,300	% volume o	f length / 100 =	45.739	% total	for Sci	an
Scan 4	96.700	_% Length X _	47.300	% volume o	f længth / 100 = _	45.739	% total	for Sci	an -
		•							

#### Percent complete coverage

Add totats for each angle and scan required and divide by # of angles to detarmine;

\_\_\_\_\_% Total for complete exem

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#### Note:

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

Site Field Supervieor:

Rod Shaffald

Date: 12-14-09

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52. - SHELL

JUBE SHEET - SI





COVERAGE	
- Full	
PART	77
	1

	C 1.C1.30.0008
	TIEM 10 201.030.0119(1/2-13.0)
READER # 307- UT-05-059	WELD NO. JANSHX-2B-SIC
	TUSP. David K 3- II
ATTACHMENT of 4	DATE DUISOLOS
	SCALE FULL



COVERAGE	
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PART	
Klaste	

· 🕋	- <u>CI.CI.30.0008</u>
	TIEM NO 601-030-011 gen 12:131
REPORT # DUP - 01 - 03 - 039	WELD NO. IANSHY-2B-515
<b>N</b> u	TALSP. Dough K 3 - IL
ATTACILLEUT 2 of 4	DACE 04/30/05
	SCALE FULL

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ATTACHMENT PAGE & OF 101

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	PART	77
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	•		CI.CI.30.0008
		TTEM NO.	601-030.011 - h 12 8:0
76101x # 30P-UT-05-054		Julie 10.	IRUSHV-2B-SIG
2 N 11		INSP.	David K 3- II
ATTACHMENT 3 of 4		DATE	04/30/05
	· · · ·	SCALE	FULL



SUPPLEMENTAL AREA - 60°RL (SCANZ) <u>v.9in</u> A=( Zin F. Sin A= lin<sup>2</sup> 72512 = 375 ÷ ,325in % EXAMINED . 1.12.12 +100 = 29.0

ABE 9 OF 3 /

LOVERAGE	
- Full	
PART	_77

	- <u>CI.CI.30.0008</u>
	LIEM 10 COLOBORITSCHILL!
ACPONT # BOP-JT-05-054	WELD NO. TANSHY-2B-514
	INSP. Devel K 3- IL
ATTACHMENT 4 of 4	DATE OUBOOS
·	SCALE FULL

ATTA	CHN	I <u>e</u> n	Ţ	B
PAGE	10	0 F	3	1

## UT Vessel

Dining

Si	te/Unit:	Catawb	a /	1			P	rocedure:	NDE	E-3630		Out	age No.:	C1-1/	3
Summa	ry No.:	C	C1.C1.3	0.0009			Proced	lure Rev.:		1		Re	port No.:	UT-09-7	
Work	scope:		IS	1			Work C	)rder No.:	018	63584			Page:	i of	5
Code:		1998/20	000A			Cat./Iten	n: C-A/C	1.30	Loca	tion:	······				
Drawing No.:		CI	N-ISIN3	-1563-1	.0		Description:	Tubesheet	to Shell						
System ID:	NS														
Component ID:	1BNS	IX-2A-50	)						Size/Len	gth:	50"/157	Thickne	ss/Diameter:	0.625	0.0/55
Limitations:	Yes, s	ee attacl	ned limi	tation :	sheet				-	Start	Time:	240	Finish Time	: 1/	100
Examination S	urface:	Insid	de 📋	0	utside 🖌	]	Surface Con	dition: AS V	VELDED						
Lo Location:		C/L of N	lanway		Wo L	ocation:	Centerline of	Weld	Couplant:		ULTRAGEL	<u> </u>	Batch No.:	07 <sup>.</sup>	125
Temp. Tool Mf	g.:	F	luke		Se	rial No.:	OCQUA330	90	Surface Te	mp.: _	71	۴			
Cal. Report No	).:						CAL-09-318, 319, 3	20							
Angle Used	0	45	45T	60	60T	60RL	]						•		
Scanning dB				56.9	58,9	70									
Indication(s):	Yes [	No No	<b>•</b> □				Scan Coverage: U	pstream 🗌	Downstream	n 🖌	CW 🗹	ccw 🗹			
Comments:								•							
60°RL scanne	d with	70 dB du	e to sig	<b>jnal to</b> :	noise rat	io.									
				•											
Results:	Acc	ept 🔲	Reje	:ct 🖌	Inf										·
Percent Of Cov	/erage (	Obtained	> 90%:		No		Reviewed Previo	us Data:	Yes		·				
Examiner L	evel II.	N	1		Signatur	•	Date	Reviewer	hs IT			Signature	:	12.1	Date
Ransom, Greg	J.		un		Signally		12/5/2009	Site Review		wer		Signature	·		<u>3. 07</u> Date
Day, John, C.	5 Y 64   -		6	-]/h		1	12/5/2009		r			<u>-</u>			2010
Other Le	evel II-	N	111	F	Signature	;	Date	ANII Reviev	Υ			Signature	<del></del>		Date
Dean, Steven			Uhr	1	2		12/5/2009	Z	12 B	ŧŹ	alter	12-	14-09	_	

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ATTACHMENT E Page // OF 3/

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# Ultrasonic Indication Report

						ບ	Itrasc	onic l	ndica	tion I	Repoi	rt				P A 6 E	// UF 3/
		Site/Un	it <u>Ca</u>	tawba	1	1		:	Procedur	re:	NDE	-3630		Outage No.;	_	C1-18	
	Su	immary No	).:	C1.	C1.30.0	009		Proce	dure Rev	v.:		1		Report No.:	ປ	Г-09-2	84
		Workscop	e:		ISI			Work	Order No	o.:	0186	53584		Page:	2	of	5
Sea	arch Unit A	ngle:	60		0			0 P	iping We	elds						Wa Ct.	Wmax
	Wo Loca	ition: Cer	nterline	of Weld	•			0 F	erritic Ve	ssels	2"T				_	1	W1 W2
	Lo Loca	tion:	0°		-			<u>ہ</u> و	other	Vesse	<2"T			[			
MP	Metal I	Path			Wr	nax C	Distance	From W	o To S.U	. At Maxi	imum Re	sponse	<b>-</b> ].			<u> </u>	هر
RBF	R Remai	ning Back	Reflectio	n	W1		Distance	From W	o At	0	f Max (Fe	orward)		1 1 1			DATUMI Lo
ι	Distan	ce From D	atum		WZ	2 C	Distance	From W	o At	о	f Max (Fo	orward)			1	<u> </u>	
														12		<u>~</u>	
Con	iments: I	FC 09-01,	09-05													± I	WI Winax W2
[	Indication	%	Ţ	W	For	ward	Bac	kward	LI	Ţ L	12	RBR	J	R	emark	<u> </u>	
Angle	No.	Or	N	Aax	14/4	Of Max	14(2)	Of Max	10	Max	of	Amp.					
50	1	223	.96	1.2	NA	N/A	N/A	N/A	360"	117*	INT.	NIA	Geometry				
				ļ			ļ	ļ	· .	<b> </b>	ļ	ļ					
											ļ						
			<b> </b>						<u> </u>			<u> </u>					
										{	<u> </u>	<u> </u>	<u> </u>				
xaminer	Level	11_N			Signature			D	ate Revi	iewea	1			Signatu	re		Date
Ransom,	Greg J.		Fre		14			12/5/20	009	DE	ATT	el			_		12.13.09
xaminer )av. John	Level	11-N		02	Signature	N	-	D 12/5/20	ate Site	Review	1			Signatu	re		Date
)ther	Level	li-N		11/3	Signature	~ <i>j</i>		D	ate ANII	Review				Signatu	e		Date
Dean, Ste	ven			fllm;	t-			12/5/20	09	_ 7	en	the c	alon to	1 12	-14	-09	2

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		Suppleme	al Report		Å T PA Report No.: Page:	11ACHMENI B 16E /2 OF 31 UT-09-284 3 of 5	
Summary No.: <u>C</u> Examiner: <u>R</u> Examiner: <u>D</u> Other: <u>D</u>	1.C1.30.0009 ansom, Greg J. Herfflamson ay, John, C. Al-W ean, Steven Atta: Al-	Level: <u>II-N</u> Level: <u>II-N</u> Level: <u>II-N</u>	Reviewer: Site Review: ANII Review:	AS Jour	len tut		Date: $12.5.69$ Date: Date:
Comments: Ind Sketch or Photo: 2:\\	d, #1 is a geometric reflector due to Tube Shi JT\IDDEAL\ProfileLine2.jpg	eet. Condition was v	erified by plotti	ing as shown below	w. 		
	sHell 5-J	e t	Trak	le sheet S-2			·. 
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	A J	TACHMENTR
DUKE POWER COMPANY		*/ <u>3</u> [[F]]
ISI LIMITATION REPORT		
Component/Weld ID: 1BNSHX-2A-50 Item No: C1.C1.30.0009		remarks:
NO SCAN SURFACE BEAM DIRECT	ION	Tube Sheet Configuration
L'IMITED SCAN 1 2 1 2 0 1 2 0 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 0 1 1 2 1 1 2 0 1 1 2 1 1 2 0 1 1 2 2 1 1 2 2 1 1 2 2 3 1 2 2 3 <	cw 🛛 ccw	See past data for UT limited
FROM L N/A to L N/A INCHES FROM WO CL t	o Beyond	calculations.
ANGLE: 0 1 45 8 60 other FROM 0 DEG to	360 DEG	
NO SCAN SURFACE BEAM DIRECT	ON	*Support lugs located @ 45°,
LIMITED SCAN 🛛 1 🗌 2 🗌 1 🖾 2 🖉 c	w & ccw	135°, 225° & 315°. Each length
FROM L * to L * INCHES FROM W0 +1.0" to	o Beyond	@ 17.5" 43.95% of total length
ANGLE: 0 0 45 Ø 60 other FROM <u>N/A</u> DEG to	N/A DEG	
NO SCAN SURFACE BEAM DIRECTION	ON	Nozzle = 3.5% of exam length
LIMITED SCAN	w 🛛 ccw 🛛	
FROM L $+0+70.5$ to L $+0+76.0^{4}$ INCHES FROM W0 $+0.5^{4}$ to	Beyond	
ANGLE: $\Box 0 \Box 45 \boxtimes 60$ other FROM <u>N/A</u> DEG to	N/A DEG	
NO SCAN SURFACE BEAM DIRECTION	N	Nozzle = 3.5% of exam
	w 🛛 ccw 🗍	length
ROM L 0+81.0" to L 0+86.5" INCHES FROM W0 +0.5" to	Beyond	Sketch(s) attached
ANGLE: 0 0 5 8 60 other FROM N/A DEG to	N/A DEG	🛛 yes 🗌 No
Prepared By: Gregory Ransom Key Theme Level: 11 Date: 12/05/09	Sheet	_4 of _5
Reviewed By: Authorized Insp	pector.	Date:

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## Determination of Percent Coverage for UT Examinations - Vessels

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Site/Unit:	tawba /	1	Procedure:	NDE-3630	Outage No.:	C1	-18
mary No.:	C1.C1.30	9000.	Procedure Rev.:	1	Report No.:	UT-0	-284
/orksoope:	181		Work Order No.:	01863584	Page:		f <u>5</u>
<u>0 deg Plan</u>	Ľ						
Scan		% Length X	% v	olume of length / 100 =	9	6 total for	0 deg
		•					
<u>45 dec</u>					,		
Scan 1		% Length X	<u> </u>	olume of length / 100 =		% total for	Scan 1
Scan 2		% Length X	Śv	olume of length / 100 =		6 total for	Scan 2
Scan 3		% Length X	<u> </u>	olume of length / 100 =		% total for	Scan 3
Scan 4		% Length X	% v	olume of length / 100 =		% total for	Scan 4
Add to	tais and divid	le by # scans = .	% tot	al for 45 deg			
							•
Other deg	60						
Scan 1	49.050	% Length X _	25,480 %	volume of length / 100 = _	12.498	% total for	Scan 1
Scan 2	100,000	% Length X _	0.000 %	volume of length / 100 = _	0.000	% total fo	Scan 2
Scan 3	93.000	% Length X _	<u> 53,300 %</u>	volume of length / 100 = _	49.569	% total fo	scan 3
Scan 4	93.000	% Length X	<u>53.300</u> %	volume of length / 100 = _	49.569	% total fo	r Scan 4
Add to		de by älecene a		tel for 60 deg			
			,				
Percent o	amplete cove		4				
		e una ecen require	u and divide by # 01	angles to determine;			-
Note:	_ % Total for	complete exam					c t
Suppleme obtained v examinatio	ntel coverage rith angles as on.	may be achieved i noted above shall	by use of other angle be calculated and a	ss / methods. When used, dded to the total to provide	the coverage fo the percent tota	r volume r I for the ci	iot implete
			11:00				Ĺ
Site Field	Supervisor:	Kod Ship	hld	Deta: <u>/2</u>	14-09		. ^
		μ					(Ľ

TUBESHEET- SZ



71 - SHELL







ATTACHMENT B

COVERAGE	
Full	
PART	277
, but	

TUBESHEET - SZ

•	C1. C1. 30.00.
LTEM NO.	Cotto So. DITSch. 31
WELD NO.	IANSHV-ZA-50
INSP.	Daniel K. S.
DATE	04/30/05
SCALE	FULL

) REPORT # BOP-UT-05-055 ATTACHMENTZ of 4





COVERAGE	
- Fure	
PALT	
	12552320

	C1. C1. 30.001 2_
ITEM NO.	Conosa anz Sch 30
SalFLO 110.	IBUSHV-ZA-50
INSP.	Dowell K. The
DATE	04/30/05
SCALE	FULL

BITALIMENT 3 of 4





	CI.CI.30.000
. )	TIEM NO. COLOSO OUTSCH BE
REPORT # BUP-UT-05-055	JANELD JA, IBJSHV-74-50
	TAISP. Shundle Ke
ATTACHMENT 4 of 4	DATE 04130105
	Scale Pull

# ATTACHMENT B PAGE 19 OF 31

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ووراهها والمحاوريات والمراجع والمحاورية المحاف المراجع والمراجع الم

**7**\*

Puk Dener	ө 19У-			UT F	'lpe We	eid Exai	nination						
S	ite/Unit:	Catawba /	1		P	rocedure:	PDI-UT-1	Û.	Ċ	Jutage No.:	C1	-18	
Summ	ary No.:	C1,C5,1	.0001		Proced	ure Rev.:	C		1	Report No.:	UT-0	9-207	
Work	kscope:	IS			Work O	rder No.:	0\$86368	3		Page:	<u>1</u> c	я <u>5</u>	
Code:		1998/2000A	0	at Alem:	C-F-1/C	5.11	Location:						
Drawing No.:		CNM 1201.	Q1-576	De	acription:	Note to T	ransition Ring						
System ID:	CA											1,12"	0.0
Component ID:	1SGD-	N281					Size/Length:	NIA	Thick	ness/Dlametr	ar: 4.84!	7.5/CS-Inc	
Limitations:	See lim	itation sheet					Sta	ut Time:	1015	Finish Tor	18;	1048	,
Examination S	urfa <b>ca</b> :	inside 门	Outaide 🛃	ទា	urface Coni	dition: AS (	ROUND	······································					_
Lo Location;		9,1.1.1	Wo Local	on: <u>Ce</u> r	terline of	Weld	Couplant:	ULTRAGE	EL N	Batch No.:		07125	
Temp. Tool Mi	p:	D.A.S	Serial )	ło.:N	ICNDE328	05	Surface Temp.;	68	<b>`</b> F				
Cal. Report No	ا		CAL-09-248,	249, 250, 251,	8 252								
Angle Used	0	45   45T	60 45L	42L						•			
Scanning dB		36.1 43.4	73.9 84.6	63.8							_		
indication(s):	Yes	No 🖸		Scan Cov	erage: Uj	pstream 😥	Downstream	CW M	ccw	M	` <b>.</b>		
Comments:						•				11			
N/A													
										e			
Results: Ac	xcept 反	Reject []	inio (j			•							
Percent Of Cove	rage Ol	stained > 90%:	No	Review	ved Previo:	us Data:	Yos ,			•			
Examiner Lo Tucker, David K	evel 11-2	" Ilaila	Signature		Date 12/1/2009	Reviewer	DELlanse	······	Signat	vie	12.1	Date 16-59	10
Evaminer Le N/A	vel NI	A	Signature		Date	Site Review	, ,		Signat	ure		Date	
Ciltor La N/A	vel NJ	1	Signature		Date	ANII Review	A De	71.1	Signat	ure -AC		Date	•

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DUK	<b>E POWER COMPANY</b>		PAGE 20 OF 31
IS	I LIMITATION REPORT		
Component/Weld ID: 1 SGD-W261	item No: <u>C1.C5.11.0001</u>	remarks:	
NO SCAN	SURFACE BEAM DIRECTION	Due to nczzle co	nfiguration
	x→1 ⊠ 2 □ 1 ⊠ 2 □ cw □ ccw [		
FROM L N/A to L N/A	INCHES FROM WO CL 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 WO to		
ANGLE: 0 0 45 60 0	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 0 45 60 c	ther FROM DEG to DEG		
NO SCAN	SURFACE BEAM DIRECTION		
LIMITED SCAN	] 1 [] 2 [] 1 [] 2 [] cw [] ccw [		
FROM L to L	INCHES FROM WO to	Sketch(s) a	attached
ANGLE: 0 0 5 0 60 0	ther FROM DEG to DEG	🛛 yes	🗋 No
Prepared By: David Tucker Chuilt	Level: II Date: 12/01/09 Sheet	2 of	5
Reviewed By:	Date: 12.10-09 Authorized Inspector.		Date:

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Summary No.: Examiner: Examiner: Other:	C1.C5.11.0001 Tucker, David K. <u>Khuil KTuchu</u> N/A N/A	Level: II-N Level: <u>N/A</u> Level: <u>N/A</u>	Reviewer: Site Review: ANII Review:	DE Housen		Date: /2 Date: Date:
Comments:	1 SGD - W261 Axial Coverage		Total AREA	A FOR AREA OF INT	EREST :	·
Sketch or Photo:			AREA	= ABCD = 1.4/10 * .3510 =	0.49m2	
			To Coverance	е For Ахияс Scar =	100%	
43°5	43'S 60'L 47"L	 -	5ес бниет	4%5 FOR TOTAL A	Санканте <sup>-</sup> Са	9LCULATION

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<b>Dist</b>	Ķ	Supplement	tal Report	ATTACHMENT B PAGE Z2 OF 3/ Report No.: UT-09-207 Page: 4 of 5
Summary No.: Examiner: Examiner: Other:	C1.C5.11.0001 Tucker, David K. Main K. Tuchu N/A	Level: II-N Level: <u>N/A</u> Level: <u>N/A</u>	Reviewer: <u>DE House</u> Site Review: ANII Review: <u>Bound III And</u>	Date: 12-14-09 Date: Date: Date:
Comments:	1 SGD - W261 Circumferential Coverage	0	To CoveRAGE FOR CIRCUMFERA	CHTIAL SEAN :
Sketch or Photo:			Агеа = AEFD = .52m × .35m	= .182.m <sup>2</sup>
			То Салсилятин = (.1.	82m <sup>2</sup> ) 100 Am <sup>2</sup>
	422		= <u>37</u> .	. 14 %
		7	ОТАL АЦЦЕВАТЕ Сочелации Тотяс То Соч'я = <u>То</u> Ани	n Covis + 7 Cinc Covis 2
,	:		= <u>100 +</u> 2	37.14 = 68.57%

#### Report No: UT-09-207

#### Page 5 of 5

#### Summary No: C1.C5.11.0001

60° longitudinal waves = 100% coverage in one axial direction (S1 - transition ring)

45° shear and longitudinal waves = 100% coverage in one axial direction (S1 - transition ring)

45° shear and longitudinal waves = 37.14% coverage in one circ. direction (S3 - CW)

45° shear and longitudinal waves = 37.14% coverage in one circ. direction (S4 - CCW)

Total aggregate coverage = (100% + 100% + 37.14% + 37.14%)/4 = 68.57%

Examiner James J. Mc Challe un

Date: 12/08/2009

UT Pipe Werd Examination

Attachnen i B Page 24\_of 31

5	Site/Unit	Catawba /	1		1	Procedure:	PDI-UT	-10	0	utage No.;		C1-18	
Summ	ary No.:	C1.(	C5.11.0002		Рюсе	dure Rev.:	C		R	eport No.:	ហ	-09-27	7
Wor	kscope:		isi	Work Order No.:			• 015609	33	Page:			of	8
Code:		199 <b>8/</b> 2000A		Cat/item:	C-F-1/0	25,11	Location	:					
Drawing No.:		CN-1	CA-66		Description:	Nozzle to	Elbow			<u>"</u>		محبوب مربو	
System ID:	CA												
Component ID:	1CA66-	35					Size/Length:	N/A	Thick	ess/Diamet	er. D.	71/6.0/	CS-Inc
Limitations:	See Ilmi	itation shee	t			·	\$	tart Time:	1215	Finish Tin	ne:	139	9
Examination S	urface:	inside (	] Outside [	3	Surface Cor	dition: AS	GROUND						
Lo Location:		9.1.1.1	Wo	Location:	Centerline of	Weld	Couplant:	ULTRAGE	L 11	Batch No.:		0712	15
Temp. Tool Mf	g.:	D.A.\$	s	erial No.:	MCNDE32	<u>835</u>	Surface Temp.	.:76	_ "F				
Cal. Report No	سیست <sup>ش</sup> ا		CAL-05	-325, 326, 327,	328 & 332								
Angle Used	0	45 45	T .60 .	77						• •			
Scanning dB		40.3 48	.2								•		
Indication(s):	Yes 🔽	No 🗍		Scan	Coverage: U	pstream 🗹	Downstream	cw 🗹	ccw 🗹	3			
Comments:						•					•		
*Scanning dB	s for wel	d crown an	d surface 1 scans	: 45°S, Ax = 38	.3; 45°L, Ax = 1	79.8; 45°L, (	;irc = 64.1 + 60*L	., Ax = 61.9					
-			•	-	. ,								
Results: Ac	cept 📋	Reject	23 info (	L									
Percent Of Cove	rage Obl	ained > 90%	: <u>No</u>	Re	eviewed Previo	us Data:	Yes	•					
Staminer Le	vel II-N	1	Signatur	2	Date	Reviewer	Net	······································	Signatur	e			Date
ucker, David K		<u>florif</u>	And	•	12/5/2009	· · · · ·	De Jour	<u>m</u>			16	2.13	- 09
xaminer Le WA	vel N/A	- •	Signature	•	Date	Sile Review			Signatur	6			Date
thèr Le	vel N/A		Signalure	}	Date	ANII Review	2	~	Signature	;			Date
<u>UA</u>			······			X_	math 4	authe	12-1	2-09			]

c2	192 <u>9</u> 17.	Site/Ur	il: Ca	tawba	J	1			Procedui	re:	PDL	-UT-10	Outage No.: C1-18
	S	ummary N		CI	.C5.11.0	002	······ .	Proce	edure Re	v.:		C	Report No.: UT-09-277
		Workscop	e:		ISI	·····		Work	Order N	o.:	015	60933	Page: 2 of 8
Sez	urch Unit A	nale:	45	8L ·	<u>ه</u> ک			(i) P	'iolna We	sids			₩o ₩max CL {
	Wo Loca	atton:	9.1.1	.1	-			OF	entic Ve	ssels 2	27		W1 W2
	Lo Loca	tion: Vi	ald Cerr	terline	-			Õ 0	lher				
MP	Metal	Path			W	max (	Distance F	rom W	o To S.U.	. At Max	mum Re	esponse	DATUM
RBR	Rema	ning Back	Reflectio	'n	W 14		Distance r	1057 VV		0	n Max (r 1 May (c	orwaru)	
L		ce From D		······	•••				<u> </u>				
Cam	ments; I	N/A											
	Indication	% ~		W	Fa	Mand Ol Man	Backy	vard	11	L	12	RBR	Remarks
Sie	NO.	DAC	W	MP	WI	MP	W2 1	MP	OI Max	(Ties)	Of Max	Amp.	
5.	1	120	1.25	0.981	N/A	N/A	N/A	NJA	1" cow	tdc	2.0	NA	Roat geometry
-1													
-+							┟┈┈╸┼				ļ	ļ	
- 1												ļ	
	1				·								
<u></u>		4-N	71	يسرر ا	Signator			D	ate Revi	ewer			AL Storature Date
ner	Level	11	· · // .	1 <b>1 - 1</b> -				12/5/20	09 Gayl	e E Hou	ser Lov	nel II	12/13/2005 12/13/2005
ner r, Da	Level	Ala							1 1000				ويستعربون بالمادي ويستجرب الجران المراجع الأست الأوليا المتحد بالبالا المتكافية المتحاط المتراجل المتحال المتحا

ATTACHMENT B PAGE 25-01 31

· ·				
	Supplemental	Report	Report	No.: UT-09-277
			/ Pe	ige; <u>3</u> of <u>8</u>
Summary No.: C1.C5.11.0002			~ 1	
Examiner: Tucker, David K.	Level: II-N	Reviewer: Gayle E Hou	iser Level II Housen	Date: 12/13/2009
Examiner: N/A	Level: N/A S	ite Review; NA		Date;
Other: N/A	Level: N/A Al	NII Review: Douthit, K.	Kernett (. Deutti	Date: 12/14/2009
Comments: 1CA55-35 Due to grinding to provide a "flush weld" indication resolution confirmed using hij transducer exit point.	" procedural requirement, new gher angle exam (60"RLJ and p	profile data was taken profile plot. Wo for indic	us TDC of the component. See ation #1 was taken from taper	e page 8 of 8. transition to
Sketch ar Photo:				
		e u		•
	45 -RL	÷+		
			•	
			•	
				•
مرد المراجع الذي يعالك مايا كواليان البراني في العام المالية ، في المراجع العالي بين عن التي يتري بين كراس الم المراجع المراجع الذي المالية المراجع العالية البراني في المراجع المراجع المراجع المراجع المراجع المراجع المراجع			· · · · · · · · · · · · · · · · · · ·	•

D	UKE POWI	ER COM	PANY			PAGE 27.0F 31
<i>D</i>	ISI LIMITAT	TION REP	A			
Componentivera ID: 1CA66-3		em No: <u>C1.C</u>	5.11.0002		remarks:	
NO SCAN	SURFACE	BEA	M DIRECTIO	N	Use to weld tape	er
LIMITED SCAN	⊠ 1 □ 2		] 2 🛛 cw	🛛 🖾 ccw		
FROM L N/A to L N/A	INCHES	FROM WO	) to	1.35"		
ANGLE: 0 🛛 45 🗌 60	other	FROM 0	DEG to	<u>360</u> DEG <sup>.</sup>		
NO SCAN	SURFACE	BEAN	M DIRECTION	4		
LIMITED SCAN	1 2		] 2 🗌 cw	C ccw		
FROM L to L	INCHES FR		to			
ANGLE: 0 45 60	other	FROM	_ DEG to _	DEG		
NO SCAN	SURFACE	BEAN	DIRECTION			•.
LIMITED SCAN	1 2		2 🗌 cw			
FROM L to L	INCHES FR	OM WO	to			
ANGLE: 0 0 45 60	other	FROM	_ DEG to	DEG		
	SURFACE	BEAM	DIRECTION			
LIMITED SCAN	1 2		2 🗌 cw			
ROM L to L	INCHES FR	OM WO	to		Sketch(s) a	ttached
A NGLE: □0□ 5 □ 60	other	FROM	DEG to	DEG	🛛 yes	🔲 No
repared By: David Tucker	Level: 11	Date: 1	2/05/09	Sheet	4 of	3
eviewed By:	Date: 12	-13.09 AU	ithorized Inspect	in the	12-14-00	Date:

-----

	£	Supplemer	Report	ATTACHMENT B PAGE 28 OF 31 <sub>Report No.:</sub> Page:	UT
Summary No.: Examiner: Examiner: Other:	C1.C5.11.0002 Tucker, David K. Main Manual Manual Mineral Min	level: II-N Level: <u>N/A</u> Level: <u>N/A</u>	Reviewer: Site Review: ANII Review:	David K. 3 - II-	Date: <u>02/24</u> /20/ Date: Date:
Comments: Sketch or Photo:	1CA66-35 Axial Coverage <i>Total Area = ABCD = AHMD+ HII</i> = <u>(.25+.22</u> ).78 + (. <u>28+.25</u> ).07	NH+ IJON + J + <u>(.22+.28)</u> ,15 + <u>(.25+.35</u> ).60 <u>-</u> -		455 455 451 60L	451 605 455 601 605 455
,	6 Сочепабе Ог Ахнал Scans =	<u>100%</u>		R LAND C	

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Penergy.	Supplemer   Report	PAGE 29 OF 31 Report No.: Page:	
Summary No.: C1.C5.11.0002	and the second se	1	
Examiner: Tucker, David K.	Level: II-N Reviewer	Havil K 3 Th	Date: 02/24/2010
Examiner: <u>N/A</u>	Level: <u>N/A</u> Site Review		Date:
Other: N/A	Level: <u>N/A</u> ANII Review	·	Date:

Comments: 1CA66-35 Circumferential Coverage

Sketch or Photo:

AREA OF CIRCUMPERENTIAL COVERAGE = .9/ 1 + . 25 ... = . 2275 ...2



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To CONGRAGO DE CIAC SEANS = (Aun OF Crec Covis) \* 100 Torge Anim = 54.24% 1 TOTAL AGGREGATE COVERALE = To CIRC Cove + To AXIAL Cove = 54.24+100 = 77.1276

ATTACHNENT B PAGE 30 OF 31

Report No: UT-09-277

Page 7 of 8

Summary Number: C1.C5.11,0002

Axial coverage (S1, S2): 100%

Circ. coverage (CW, CCW): \$4.24%

,

Aggregate coverage: 100% + 54.24% = 154.24%/2 = 77.12%

TH Examiner: David K. Zimmerman Dewick 02/24/2010

	<b>%</b>	Supt	olemen	ital Report	ATTACHMENT Page 31 OF 31	B Report No.: Page:	ູ 	78
Summary No.: Examiner: Examiner: Other:	C1.C5.11.0002 Tucker, David K. ///////////////////////////////////	Leve	: <u>II-N</u> : <u>N/A</u> : <u>N/A</u>	Reviewer: Site Review: ANII Review:	DE Jousen Barn: the Contert		Date: /2 · / · Date: Date:	<u>4.09</u>
Comments: Sketch or Photo:	1 С.А. 66 - 35 Nez Connoun Такс	Ar TDC 299 . Ar TDC 299 . 589 .	. 672	424 · • • • • •	1.320	Truvs, Rivi	ntion Z	
	Eisar			24. 54.	1.32,	Truvs, Rive	TION L	

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## Attachment C

Unit 2 EOC 16 Examination Data

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## UT Vessel Examination

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ATTACHMENT C PAGE 1 OF 23

Site/Unit:		Catawba / 2						Pro	cedure:	ND	E-820		(	Outage No.:		C2-16		
Summa	ry No.:	C	2.C1.10	.0002			Р	rocedur	re Rev.:		3			Report No.:		UT-09-'	140	
Work	scope:		<u>ISI</u>				W	Work Order No.:			01817953			Page:	_1	of	18	
Code:		199	8		(	Cat./Item	::C	-A/C1.1	10	Loca	ition:							
Drawing No.:		CI	N-ISIN3-	2553-1.	0		Descrip	tion: L	ower Shell	l to Transiti	on Co	ne						
System ID:	NC							_										
Component ID:	2SGC	-04B-05								Size/Len	gth:	N/A	Thic	kness/Diamo	eter:	3.060	0.00/CS	
Limitations:	See S	uppleme	ntal Rep	orts							Sta	rt Time:	1010	Finish T	ime:	1	250	
Examination S	Surface:	Insid	le 🗌	Ou	itside 🗹		Surface	e Condi	tion: AS G	ROUND								
Lo Location:	-	9.2	2.1		_ Wo Lo	ocation:	Centerli	ne of W	/eld	Couplant:		ULTRAGE	. 11	_ Batch No	.:	07	125	
Temp. Tool M	ig.:		).A.S		Se	rial No.:	MCNE	)E3280	5	Surface Te	emp.:	88	_ °F					
Cal. Report No	o.:	L			С	AL-09-1	77, CAL-09-178	, and C	CAL-09-179									
Angle Used Scanning dB Indication(s):	0 Yes	45 59.6	45T 59.6	60 67.2	60T 67.2	35/35T 57.8	] Scan Coverage	e: Upa	stream 🔽	Downstrea	m 🔽	CW M	ccw	M				
Comments: F/C 09-03, Ins	pector	s: Steve	n Dean a	Band Ban	ry Muirh	Mit. ead	٦	·										
Results:	Aca	cept 📋	Reje	ct 🔽	info													
Percent Of Co	verage	Obtained	> 90%:	•	No		Reviewed	Previou	is Data:	Yes		-			_			
Examiner L Tucker, David	.evel   K.		and h	Zu	Signature	·	3/27/	Date 2009	Reviewer	Ellou	se-	-	Signa	iture		4.8	-09 Date	
Examiner L Ellis II, Kennet	.evel p th R.	-N	1	A	Signature	Z	3/27/	Date 2009	Site Review	, 10		·····	Signa	iture			Date	
Other L	evel I	N M		2	Signature	)		Date	ANII Review	~		<u> </u>	Signa	ature			Date	
nansom, Greg	J.	in	ag /	<u> </u>			3/27/	2009	n	enuts	. []	Dutter t		4-10-0	9			



## **Determination of Percent Coverage for UT Examinations - Vessels**

Site/Unit:	Catawba	2	Proc	cedure:	NDE-820	Outage No.:	C2-16	
Summary No.:	C2.C	1.10.0002	Procedur	e Rev.:	3	Report No.:	UT-09-14	40
Workscope:		ISI	Work Ord	ler No.:	01817953	Page:	AT 2 of	18
							OK2 04/04/	69
<u>0 deg P</u>	anar							
Scan	100.00	0 % Lengt	h X <u>39.440</u>	% volume	of length / 100 = _	<u>39.440</u> %	6 total for 0 de	∍g
<u>45 deg</u>					,			
Scan	1	10% Lengt	h X <u>75.750</u>	% volume	o of length / 100 = _	75.750 9	% total for Sca	in 1
Scan	2	0 % Lengt	th X <u>42.100</u>	% volume	of length / 100 = _	42.100 9	% total for Sca	ın 2
Scan	3 100.00	00 % Lengt	th X <u>39.440</u>	% volume	e of length / 100 = _	39.440	% total for Sca	in 3
Scan	4	00% Leng	th X <u>39.440</u>	w volume	e of length / 100 = _	39.440	% total for Sca	an 4
Add	l totals and d	lvide by # scan	ns = <u>49.182</u>	% total for	45 deg			
Other d	leg 35,	60						
Scan	1	00% Leng	th X 87.800	% volum	e of length / 100 = $\frac{1}{2}$	87.800	% total for Sc	an 1
Scan	2	00% Leng	ith X 42.430	% volum	e of length / 100 =	42.430	% total for Sc	an 2
Scan	3 <u>100.0</u>	00% Leng	th X <b>39.440</b>	% volum	e of length / 100 =	39.440	% total for Sc	an 3
Scan	4	00% Leng	yth X <u>39.440</u>	% volum	e of length / 100 =	39.440	% total for Sc	an 4
Ade	d totals and (	livide by # sca	ns = <u>52.278</u>	% total for	<u>35,60</u> deg			

#### Percent complete coverage

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

46.967 % Total for complete exam

Note:

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

Site Field Supervisor: David K. 3 TT Date: <u>04/04/09</u>

HMEAT C	P Dudas Energy				Limitation Rec	ord				
I AC	) Site/Unit:	Catawba	1	2	Procedure:	NDE-820	Outage No.:	(	C2-16	<u> </u>
PA6	Summary No.:	C2.C	1.10.00	02	Procedure Rev.:	3	Report No.:	דט	-09-1	40
	Workscope:		ISI		Work Order No.:	01817953	Page:	3	of	18

Description of Limitation:

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See Attachment for Limitation Calculations. Coverage Aggregate %

Sketch of Limitation: C:\Documents and Settings\BDudley\My Documents\C2.C1.10.002.bmp

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•	Total Weld/Bas	e Metal Aggregate	Percent of C	Coverage	
Angle	Scan	Base Metal	Weld Metal	Total Aggregate	
45	51	73.42	78.08	75.75	1
45	52	72:15-73,42	10.78	10.35- 42.10	Dicc
45	53	50.62 DEL	28.26	39.44	04/04/01
45	<u>\$4</u>	50.62 04 041 04	28.26	39.44	
60	S1	88.63	86.96	87.80	
35	52	71.13	13.72	42.43	1
35	53	50,62	28.26	39.44	
35	S4W	50.62	28.26	39.44	1
0	50	50.62	28.26	39.44	
			l		J

Limitations removal requirements: N/A

Radiation field: N/A

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Examiner Level Tucker, David K.	II-N	Signature	Dațě 3/27/2009	Reviewer	Parial K	Signature	Date 04/04/09
Examiner Level Vils II, Kenneth R.	11-N 2/2	Signature	Date	Site Review		Signature	Date
Other Level Ransom, Greg J.	II-N Ares	Signature	Date 3/27/2009	ANII Review	ant	Signature	Date 4-10-09
			, <u></u> , <u></u>				

Pulse Energy.	Supplemental Report	ATTACHMENT C PAGE 4 OF 23 Report No.: UT-09-140 Page: 4 of 18
Summary No.: C2.C1.10.0002 Examiner: Tucker, David K. Main March Examiner: Ellis II, Kenneth R. Constant Other: Ransom, Greg J. Marcy Prove	Level: II-N Reviewer: David C. D. Level: II-N Site Review: Level: II-N ANII Review: <u>Kennth Daut</u>	Date: <u>04/04/09</u> Date: Date: <u>4-10-09</u>

Comments: Weid Metal Percent of Coverage Total Weid Length = 432.0 in. Total Restraint Lugs (9) = 27.0 in. % Length = 27.0 in. / 432.0 in. = 0.0625 x 100 = 6.25%

Sketch or Photo: Z:\Forms\Blank Forms\C2.C1.10.0002A..bmp

•	•		

	Weld Metal Percent of Coverage							
Angle	Scan	% Length	% Area	% Coverage	Total % Aggregate			
<u> </u>								
45	51	93.75	83.12	77.93				
45	S1	6.25	2.41	0.15	78.08			
45	S2	93.75	11.50	10.78				
45	52	6.25	0.00	0.00	10.78			
45	\$3	93.75	30.14	28.26				
45	S3	6.25	0.00	0.00	28.26			
45	S4 .	93.75	30.14	28.26				
45	S4	6.25	0.00	0.00	28.26			
60	S1	93.75	90.35	84.70				
60	S1	6.25	36.17	2.26	86.96			
35	SZ	93.75	14.63	13.72				
35	S2	6.25	0.00	0.00	13.72			
35	53	93.75	30.14	28.26				
35	\$3	6.25	0.00	0.00	28.26			
35	S4	93.75	30.14	28.26				
35	S4	6.25	0.00	0.00	28.26			
0	50	93.75	30.14	28.26				
0	50	6.25	0.00	0.00	28.26			

	e e e e e e e e e e e e e e e e e e e	Supplemental Report					ATTACHMENT C PAGE 5 JF 23 UT-09-140		
	r•				Page:	5	. of _	18	
Summary No.:	C2.C1.10.0002								
Examiner:	Tucker, David K. Kais Cluch	Level: II-N	Reviewer:	Davilk. 3	TA	Date:	04/1	24/09	
Examiner:	Ellis II, Kenneth R.	Level: <u>II-N</u>	Site Review:	· · · · · · · · · · · · · · · · · · ·		Date:	<u> </u>		
Other:	Ransom, Greg J. Mars Rass	Level: <u>II-N</u>	ANII Review:	Kennett apartet	<u> </u>	Date: _	4-10	19	

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Comments: Base Metal Percent of Coverage See page 4 for % Length Calculations

Base Metal Percent of Coverage								
Angle	Scan	Scan % Length % Area		% Coverage	Total % Aggregate			
45	51	93.75	75.87	71.13				
45	S1	6.25	36.78	2.29	73,42			
45	52	93.75	75.87	71.13	1			
45	S2	6.25	36.78	2,29	73.42			
45	\$3	93.75	53.99	50.62				
45	\$3	6.25	0.00	0.00	50.62			
45	54 .	93.75	53.99	50.62				
45	54	6.25	0.00	0.00	50.62			
60	51	93.75	90.56	84.90				
60	S1	6.25	59.58	3.73	88.63			
35	52	93.75	75.87	71.13				
35	52	6.25	0.00	0.00	71.13			
35	53	93.75	53.99	50.62				
35	53	6.25	0.00	0.00	50.62			
35	54	93.75	53.99	50.62				
35	54	6.25	0.00	0.00	50.62			
0	50	93.75	53.99	50.62	<u> </u>			
0	SO	6.25	0.00	0.00	50.62			

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<b>Duke</b> Energy	<i>f</i> .	Supplemental Report	ATTACHMENT PAGE 8 OF 23 Report No.: UT-09-140 Page: 8 of 18
Summary No.:	C2.C1.10.0002		-
Examiner:	Tucker, David K.	Level: II-N Reviewer:	Date: 04/04/09
Examiner:	Ellis II, Kenneth R.	Level: II-N Site Review:	Date:
Other:	Ransom, Greg J. Sug Rason	- Level: II-N ANII Review: Zamuta	Douth 1 Date: 4-10-09

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Sketch or Photo: Z:\UT\OUTAGES\Catawba\2EOC16\UT-09-140-002.bmp



Duke Energy	Supplemental Report	ATTACHMENT C PAGE 9 DF 23 Report No.: UT-09-140 Page: 9 of 18
Summary No.: C2.C1.10.0002 Examiner: Tucker, David K. Examiner: Ellis II, Kenneth R. Other: Ransom, Greg J. Surg Rasson	Level: II-N Reviewer: Paule K.Z Level: II-N Site Review: Level: II-N ANII Review: <u>Kennette Dari</u>	Date: 04/04/09 Date: Date: <u>4-10-29</u>

Comments: (Base) Scan 2 - 35°, 45°

Sketch or Photo: Z:\UT\OUTAGES\Catawba\2EOC16\UT-09-140-003.bmp

ABCD / EPGH: Actual percent of coverage shown on Scan 1.



<b>Duke</b>		Supplemen	tal Report			ATTACHME PAGE 10 D
C Energ	<b>y.</b>		·	Report No.: Page:	UT-09-140 10 of 18	
Summary No.:	C2.C1.10.0002			•	-	
Examiner:	Tucker, David K. Mailtie	Level: II-N	Reviewer:	Variel (2)	14_	Date: 04/04/
Examiner:	Ellis II, Kenneth R.	Level: II-N	Site Review:			Date:
Other:	Ransom, Greg J. / Suzy Ranso	Level: <u>II-N</u>	ANII Review: Z	enarth_ Dat	t.1	Date: <u>4-10-01</u>
Comments:	(Base) Scan 3, 4 - 45°, 35° / 0° Scan				<u> </u>	
Sketch or Photo:	Z:\UT\OUTAGES\Catawba\2EOC16\UT-09-	140-004.bmp				
	ABE: 0.5" x 4.0" / 2 = 1.0" 2					
	ACE: 2.5" x 1.6" / 2 = 2.32" <sup>2</sup>					
	CDE: 1.2" x 0.9" / 2 = 0.54"					
	3.86° * / /.15* = 0.5399 x 10	u = 33.53%	7			
		STRUCTURAL				
		SCAN			_	
		LIMITATION	1		-	
			AB			
			$ \setminus /  $			
			$\backslash$ /			
			\ c\			
			e			
			c c c			

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Comments: (Base) Scan 3, 4 - 45°, 35° / 0° Scan: 27" Total Length

Sketch or Photo: 2:\UT\OUTAGES\Catawba\2EOC16\UT-09-140-005.bmp

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Complete Loss (0%) Coverage



S2 - Lower Shell

SI - Transition Cone





ATTACHMENT C PAGE 13 OF 23

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UT-09-140

Report No.:



# Supplemental Report

							Page:	13	of 18
Summary No.:	C2.C1.10.0002	1			0	^ · _			
Examiner:	Tucker, David K.	Mail Tuch-	Level: II-N	. Reviewer:	Davidi		Da	ate: 🔟	4/04/09
Examiner:	Ellis II, Kenneth R.	thatt. Els_	Level: II-N	Site Review:			Da	ate: _	
Other:	Ransom, Greg J.	Surg Rosson	Level: II-N	ANII Review:	Kennth	Doutht	Da	ate:	<u>H-Jolng</u>
Comments:	Scan 1 - 45° (Weld) and Scan 1 - 45° (Weld)	: 27" Total Length							
Sketch or Photo:	Z:\UT\OUTAGES\Cata	wba\2EOC16\UT-09-140-007.bmp		Z:\UT	IOUTAGESICatawba	\2EOC16\UT-09-140-008	3.bmp		
	" ^ A&C 1.5" x 1.4" / 2 = 1.05" <sup>2</sup> 6 72" <sup>1</sup> - 1,05" <sup>1</sup> = 5.17" <sup>1</sup> 5.17" <sup>1</sup> / 6.72" <sup>1</sup> = 0 8312 x 100 4.84	.12%		ABC: Q. 25° °	3" x 1.6" / 2 = 0,35" * / 5.22" * ∞0.0241 x 106 × 2:43%				
		STOUESURAL Sean Luistrarian		-		STRICTURAL Sean Interation Restriction Tasi			
	57 - Lawer Shell		St - Yranski	an Cone 52-Low	wer Shell			<b>51</b> -	Transition Cone

ATTACHMENTC PAGE 14 OF 23

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## Supplemental Report

The second se

						Re	port No.:	UT	-09-140
							Page:	14	of <u>18</u>
Summary No.:	C2.C1.10.0002				$\Lambda$ .				
Examiner:	Tucker, David K. Main Klucher	Level:	II-N	Reviewer	Javid K	12-		Date:	04/04/09
Examiner:	Ellis II, Kenneth R.	Level:	il-N	Site Review	:			Date:	
Other:	Ransom, Greg J. Sug Parser	Level:	<u>II-N</u>	ANII Review	Kennth	about the		Date:	4-10-09
Comments:	Scan 1 - 60° (Weld)								
	and Scan 1 - 60° (Weld): 27" Total Length								
	<b></b>								
Sketch or Photo:	Z:\UT\OUTAGES\Catawba\2EOC16\UT-09-140-009.bmp	)		Z:\U	T\OUTAGES\Catawba	a\2EOC16\UT-09-140-010	.bmp		
	Alter d'an a set de succes								
	ADL: 4,5 × 1,5 / 2 × 0,5 ° *			eco ABC	: 0.5" x 0.8" / 2 = 0.35"* : 1.4" x 2.7" / 2 = 1.63" *			•	
	5 62/ / 6.72 <sup>+ 4</sup> = 0.9035 × 100 = 90.35%			tota	n weld 2.25" =				
				3.25	***/ 6,23*** = 0,3617 ± 100 ± 38,179	•			
	, i i i i i i i i i i i i i i i i i i i								
	STRUCTURAL			-		STAUCTURAL			
	Liminar				, ·	Linion Tis	S		
							TT		· .
						TT.	JA .		
							/		
						8			
				0-	towar Chall	100			N - Venezisten Conc
	52 — Lower Shell		St - Transition (	Sz - Cone				3	57 — (141171701) Aður

ATTACHMENT C PAGE 15 OF 23

51 - Transition Cone

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S2 - Lower Shell

### Supplemental Report

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					Report No.:	UT-09-140
					Page:	15 of 18
Summary No.:	C2.C1.10.0002			•		
Examiner:	Tucker, David K. Muil Kluch	Level: II-N	Reviewer:	Javil 16 2	TH	Date: 04/04/04
Examiner:	Ellis II, Kenneth R. Lon K. C.S. T.	Level: II-N	Site Review:			Date:
Other:	Ransom, Greg J. /herry Parson	Level: II-N	ANII Review:	ennette Dan	th.1	Date: 4-10-09
Comments:	Scan 2 - 35° (Weld) and Scan 2 - 45° (Weld)					
Sketch or Photo:	Z:\UT\OUTAGES\Catawba\2EOC16\UT-09-140-011.bmp		Z:\UT\OUTAC	GES\Catawba\2EOC16\UT-0	99-140-012.bmp	
	ABC: 1.4" x 1.3" / 2 = 0.91" 3		ABC: 1.5" x 1.1"/2	= 0.715" <sup>1</sup>		
	0.92" ' / 6.22" *= 0.1453 x 100 = 14.63%		0 715° ° / 6,22- ° × 0	1.1150 x 100 = 11.50%		
			- 	Structural Scan Contract		

31 - Transition Cone

SZ - Laver Shell

ATTACHMENT C PAGE 16 OF 23

51 - Transition Open

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52 - Lovier Shell,

### Supplemental Report

	· · · ·						Report No.:	דט	-09-14	40
							Page:	16	_ of	18
Summary No.:	C2.C1.10.0002				Λ					
Examiner:	Tucker, David K. Anistant	Level:	11-N	Reviewer:	Janie	LK.3_	<u> </u>	Date:	04/	04/09
Examiner:	Ellis II, Kenneth R.	Level:	11-N	Site Review:				Date:		
Other:	Ransom, Greg J. Sheg Thurson	Level:	1I-N	ANII Review:	Kenne	the alocated	1	Date:	4-1	0-09
Comments:	Scan 2 - 35°m 45° (Weld): 27" Total Length and Scan 3,4 - 35°, 45° / 0° Scab (Weld)									
Sketch or Photo:	Z:\UT\OUTAGES\Catawba\2EOC16\UT-09-140-013.bmp			Z:\UT\	OUTAGES\Ca	tawba\2EOC16\UT-09	9-140-014.bmp			
				ABC: 1.	\$" x 2.5" / 2 = 1.875" '					
	UNA LOWERING - SLAVA LOOK			1.875**	' / 6.22" <sup>1</sup> = 0.3014 x 100	) = <b>30.14%</b>				
	STALE STARE SEAN LINGINGALS TORS					Structure See Linitatier	e total			-

S1 - Transition Cane

52-Liowar Shall



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Comments:

DUKE POWER COMPANY										
	ISI LIMITATION REPORT									
Component/Weld ID: 2SGC-04E	-05	remarks:								
NO SCAN	SURFACE BEAM DIRECTION	Permanent Restraint Ring								
LIMITED SCAN	□ 1 ⊠ 2 ⊠ 1 □ 2 ⊠ cw ⊠ ccw									
FROM L N/A to L N/A	INCHES FROM WO C/L to Beyond									
ANGLE: 0 0 45 60	other 35 FROM 0 DEG to 360 DEG	;								
NO SCAN	SURFACE BEAM DIRECTION	Permanent Restraint Ring								
LIMITED SCAN										
	INCHES FROM WO C/L to Beyond									
ANGLE: 0 0 45 8 60	other FROM 0 DEG to 360 DEG									
X NO SCAN	SURFACE BEAM DIRECTION	* Permanent Restraint Tabs - 9								
LIMITED SCAN	⊠ 1 □ 2 □ 1 ⊠ 2 □ cw □ ccw	(3" each) Locations: 1@0 + 17"								
FROML to L	INCHES FROM W0 +2.5 to Beyond	2@0 + 77", 3@0 + 125"								
ANGLE: 0 0 45 8 60	other FROM N/A DEG to N/A DEG	4@0 + 173.5", 5@0 + 183"								
[] NO SCAN	SURFACE BEAM DIRECTION	160 + 232", 7@0 + 285"								
LIMITED SCAN	□ 1 ⊠ 2 ⊠ 1 □ 2 ⊠ cw ⊠ ccw	8@0 + 339", 9@0 + 393"								
FROM L to L	INCHES FROM W0 +2.5 to _Beyond	Sketch(s) attached								
ANGLE: 0 0 0 45 1 60	other 35 FROM N/A DEG to N/A DEG	🛛 yes 🗌 No								
Prepared By: David Zimmerman	Level: 11 Date: 03/27/2009 She	et of								
Reviewed By:	Date: Authorized Inspector.	Date:								

#### LIMITED EXAMINATION COVERAGE CHECKLIST

ISI Summary No: <u>(7. Cl. 10.0002</u>

- (UT) Verify search unit wedge index to nose dimension;
  - (UT) Draw the examination volume showing beam paths.
  - [] (ALL) Draw the examination volume or area with obstructions including dimensions on the Supplemental Report, or if the drawing is too large, attach it to the Supplemental Report; (Marked-up drawings and/or digital photos are acceptable if dimensioned)
- (ALL) Note the scale of the drawing;

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- (ALL) Calculate coverage in a detailed and orderly method; Note: Does not apply to hangers, snubbers, restraints or supports
- (ALL) Complete IDDEAL forms: "Limitation Work Sheet" and "Supplemental Report".
- (ALL) Check the "Reject" box on the examination data sheet.

Junich K. Z Date MES NDE Level III 04/08/09

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### UT Pipe Weid Examination



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S	ite/Unit:	Catawba	17	2			P	rocedure:	NDE	-600			Outage No.:		C2-1	6	
Summa	ary No.:	- C	2.B9.11	.0106			Proced	ure Rev.:	1	7			Report No.:		JT-09-	101	_
Worl	kscope:		ISI				Work C	order No.:	0180	8431			Page:	1	of	4	
Code:		1998				Cat./item:	B-J/BS	0.11	Locati	ion:							
Drawing No.:		с	N-2NI-7	0			Description:	Valve 2NI17	5 to Pipe				-				
System ID:	NI																
Component ID:	2NI70-	4							Size/Length	า:	N/A	Th	ickness/Diam	eter:	).719	1 <b>6.00</b> i	I SS
Limitations:	See St	upplemen	tal Repo	orts			<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>			Start	Time:	1032	Finish 1	'ime:		1050	
Examination S	Surface:	Insid	e []	Ou	itside 🔽		Surface Cor	dition: AS (	GROUND						<u></u>		
Lo Location:		9.1.	<u>I.1</u>	<u> </u>	Wo Loc	ation:	Centerline of	Weld	Couplant:		ULTRAGE		Batch N	o.:	0	7125	
Temp. Tool M	fg.:	Lı	itron		Seria	I No.:	MCNDE32	833	Surface Te	mp.:	72	°F					
Cal. Report N	o.:			CAL	-09-129, C/	<u>L-09-130,</u>	and CAL-09-13	1		-							
Angle Used		45	.45T	60	60L	T	]										
Scanning dB			41	45	55		]										
Indication(s):	Yes	No				Sca	n Coverage: 🏻 🌡	Jpstream [_]	Downstream	m 🖌	CW 🗹	сс	W 🗹				
Comments:																	
None																	
Results: A	Accept (	Re	eject 🔽		Info []]												
Percent Of Co	verage (	Obtained >	• 90%:		No		Reviewed Previ	pus Data:	Yes						, <u>, , , , , , , , , , , , , , , , , , </u>		
Examiner	Level I	I-N		100	Signature		Date	Reviewer	net			Sig	nature		2		Date
Leeper, Winfre	d C.	$-\omega$	n fai	<u>/C</u>	Jeen	<u> </u>	3/16/2009		10 tou	oen					5.2	<u> </u>	2
Dean, Steven	Level H	-171	- <u>-</u>	Hai		-	3/16/2009		w ·			510	inature				Date
Other I	evel N	I/A		YUUU	Signature		Date	ANII Revie	W			Sig	inature				Date
N/A			•					1 To		<u>A</u>	. #11	4	- 8-09				

**C**/~



### Determination of Percent Coverage for UT Examinations - Pipe

N N	Site/Unit:	Catawba / 2		Procedure:	NDE-600	Outage No.:	C2-16			
A 6 H	Summary No.:	C2.B9.11.0106		Procedure Rev.:	17	Report No.:	o.: UT-09-101		01	
<b>f</b> a.	Workscope:	ISI		Work Order No.:	01808431	Page:	Page: 2 of		_4	

<u>45 deg</u>	
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DKZ	Scan 1	100.000	- % Length X	<u> </u>		<del></del>	% total for Scan 1
3/25/09	Soan 2-					<del></del>	% total for Scan 2
	Scan 3	100.00	_% Length X _	50.00	$\sim$ % volume of length / 100 =	50.00	% total for Scan 3
	Scan 4 _	100.00	_% Length X _	50.00	$_{-}$ % volume of length / 100 = .	50.00	% total for Scan 4

Add totals and divide by # scans = 50.000 % total for 45 deg

Other deg - 60 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	100.000	%	Length X	50.000	% volume of length / 100 =	50.000	% total for Scan 1
Scan 2	0.000	%	Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3		%	Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		%	Length X		% volume of length / 100 =		% total for Scan 4

#### Percent complete coverage

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

37.500 % Total for complete exam

Site Field Supervisor: CHOUSEN D.auicl K. S. II

Date: 3.22.09 3/25/09



Comments:

Sketch or Photo: C:\Documents and Settings\BDudley\My Documents\2E016\2NI70-4A.jpg



		<b>\$</b> .			ATTACHMENT C PAGE 23 OF 23
P Energy	•	Supplement	al Report	Report No.: Page:	UT-09-101
Summary No.:	C2.B9.11.0106	ievet II-N	Reviewer AF	1	Date: 5.12.05
Examiner: Other:	Dean, Steven Alle Da N/A	Level: <u>N/A</u>	Site Review:	the Docthet	Date:

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DUKE POWER COMPANY										
ISI LIMITATION REPORT										
Component/Weld ID: 2NI70-4	remarks:									
NO SCAN	SURFACE BEAM DIRECTION	Permanent Restraint Ring								
LIMITED SCAN	🗋 1 🖾 2 🖾 1 🗋 2 🗋 cw 🗋 ccw									
FROM L N/A to L N/A	INCHES FROM W0 4" to Beyond									
ANGLE: 0 0 45 8 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 0 45 60	other FROM DEG to DEG									
D NO SCAN	SURFACE BEAM DIRECTION									
LIMITED SCAN										
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								
FROM L to L	INCHES FROM W0 to	Sketch(s) attached								
ANGLE: 0 0 45 60	other FROM DEG to DEG	🛛 yes 🗌 No								
Prepared By: Winfred Leeper	Level: II Date: 03/16/2009 Sheet	_4 of _4								
Reviswed By:	Date: Authorized Inspector:	Date:								

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