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December 29, 2008

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

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Unit 3
Docket No: 50-287
Fourth Ten Year Inservice Inspection Interval
Request for Relief No. 08-ON-002

Pursuant to 10 CFR 50.55a(g)(5)(iii), attached is a Request for Relief from the requirement to examine 100% of the volume specified by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1998 Edition with 2000 Addenda (as modified by Code Case N-460).

Request for Relief 08-ON-002 is to allow Duke Energy to take credit for two (2) limited ultrasonic examinations on welds associated with various systems and components described in the attached request. The ultrasonic examination coverage of the subject Unit 3 welds did not meet the 90% examination requirements of Code Case N-460. The obtainable volume coverage for weld examination is indicated on the attached requests. Achievement of greater examination coverage for these welds is impractical due to piping/valve geometry and interferences. Therefore, Duke Energy requests that the NRC grant relief as authorized under 10 CFR 50.55a(g)(6)(i).

If there are any questions or further information is needed you may contact Corey Gray at (864) 886-6325,

Very truly yours,

Richard J. Freudenburger

for Dave Baxter,
Site Vice President

Enclosure

A047
NRR

xc w/att: Luis Reyes
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Relief Request 08-ON-002

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

Inservice Inspection Impracticality

Duke Energy Corporation

Oconee Nuclear Station – Unit 3 (EOC-22)

Fourth 10-Year Interval – Inservice Inspection Plan

Interval Start Date = 1-2-2005 Interval End Date = 12-16-2014

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

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

List Number	Weld ID	Item Number/Summary Number
1.	3LP-134-103	C05.011.004
2.	3HP-365-9C	C05.021.052

Attachment A contains the inspection data for these two welds.

Items in this relief request were examined during February of 2006.

I. ASME Code Component Affected

Weld ID = 3LP-134-103
Item Number/Summary Number = C05.011.004
Low Pressure Injection System
Reducer to Valve 3LP-18 Weld

II. Applicable Code Edition and Addenda

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

III. Applicable Code Requirement

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

IV. Impracticality of Compliance

The valve material is SA-351/CF8M cast stainless steel and the reducer material is SA 403/WP304 stainless steel. This weld has a diameter of 10.0 inches and a wall thickness of 1.125 inches.

During the ultrasonic examination of this weld, 37.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50% of the weld and base material; 60° shear wave scan perpendicular to the weld covered 50% of the weld and base material from one axial direction from the reducer side.

The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the weld and adjacent base material from the reducer side perpendicular to the weld. This coverage was not included in the aggregate coverage calculation.

V. Proposed Alternate Examinations or Testing

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

VI. Implementation Schedule and Duration

This request is for the duration of the fourth inservice inspection interval, currently scheduled to end on December 16, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C05.011.004 was conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1998 Edition with the 2000 Addenda as administered by the PDI. In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on the C05.011 item and achieved 100% coverage. The result from the surface examination was acceptable.

In addition to the C05.011 weld that relief is being requested for limited volume coverage, there was 1 additional C05.011 weld that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of them. The additional weld was from the same system as the C05.011 weld of this request. The examination and result of the additional weld contributes to the reasonable assurance of pressure boundary integrity for this system piping.

Duke does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration, but cannot be used beyond the first path leg. Duke uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds when the nominal material thickness exceeds 0.5 inch. A supplemental 60° refracted longitudinal wave is used to interrogate the far side of the weld when the nominal material thickness is greater than 0.5 inch. However, coverage from this supplemental scan is not included in the aggregate coverage calculation.

Duke will use Class 2, Examination Category C-H, pressure testing and VT-2 visual examination to compliment the limited examination coverage. The Code requires that a pressure test be performed once each period for Class 2 items.

This test requires a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity. A pressure test and VT-2 exam were performed during May of 2006 (first period of the fourth interval) and no leakage was found for this segment of piping.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide confidence that, in the event leakage did occur through this weld, it would be detected. Specifically, visual observations performed during operator rounds provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects.

Based on the coverage and results of the required volumetric, surface, and pressure testing (VT-2) examinations performed and the operator rounds, it is Duke's position that a reasonable assurance of quality and safety exists.

I. ASME Code Component Affected

Weld ID = 3HP-365-9C
Item Number/Summary Number = C05.021.052
High Pressure Injection System
Tee to Pipe Weld

II. Applicable Code Edition and Addenda

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

III. Applicable Code Requirement

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

IV. Impracticality of Compliance

The tee material is SA 403/WP304 or WP316 stainless steel and the pipe material is SA 376/TP 304 or TP316 stainless steel seamless pipe. This weld has a diameter of 4.0 inches and a wall thickness of .674 inches.

During the ultrasonic examination of this weld, 89.40% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the weld and base material; 60° shear wave scan perpendicular to the weld from the pipe side covered 85.80% of the weld and base material from one axial direction. A 60° shear wave scan perpendicular to the weld from the tee side of the weld covered 71.60% of the weld and base material.

The limitation was caused by the radius on the tee side of the weld which obstructed scanning for 4 inches from that side. In order to scan all of the required volume for this weld, the tee would have to be redesigned to allow scanning from both sides of the weld for 360°, which is impractical. There were no recordable indications found during the inspection of this weld.

A supplemental scan using a 60° refracted longitudinal wave from the pipe side covered 14.2% of the examination volume in the obstructed area. This coverage was not included in the aggregate coverage calculation.

V. Proposed Alternate Examinations or Testing

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

VI. Implementation Schedule and Duration

This request is for the duration of the fourth inservice inspection interval, currently scheduled to end on December 16, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for the item number C05.021.052 was conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1998 Edition with the 2000 Addenda as administered by the PDI. In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on this C05.021 item and achieved 100% coverage. The result from the surface examination was acceptable.

In addition to the C05.021 weld that relief is being requested for limited volume coverage, there were 10 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any reportable indications and 100% coverage was obtained on each of them. The 10 additional welds were from the same system as the C05.021 weld of this request. The examination and results of the 10 additional welds contributes to the reasonable assurance of pressure boundary integrity for this system piping.

Duke does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration, but cannot be used beyond the first path leg. Duke uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds when the nominal material thickness exceeds 0.5 inch. A supplemental 60° refracted longitudinal wave is used to interrogate the far side of the weld when the nominal material thickness is greater than 0.5 inch. However, coverage for this supplemental scan is not included in the aggregate coverage calculation.

Duke will use Class 2, Examination Category C-H, pressure testing and VT-2 visual examination to compliment the limited examination coverage. The Code requires that a pressure test be performed once each period for Class 2 items.

This test requires a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity. A pressure test and VT-2 exam were performed during May of 2006 (first period of the fourth interval) and no leakage was found for this segment of piping.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide confidence that, in the event leakage did occur through this weld, it would be detected. Specifically, operations performs a daily leakage calculation to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage" are not exceeded. Operations also conducts rounds during which evidence of leakage would be detected prior to gross failure of the component.

The weld/component was inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects.

Based on the coverage and results of the required volumetric, surface, and the pressure testing (VT-2) examinations performed and the other activities, it is Duke's position that a reasonable assurance of quality and safety exists.

REQUEST RELIEF 08-ON-002

ATTACHMENT A

Total Number of Pages = 11

Pages 1-4 are for weld 3LP-134-103 (C05.011.004)
Pages 5-9 are for weld 3HP-365-9C (C05.021.052)

Page 10 is a limitation summary for weld 3LP-134-103 (C05.011.004)
Page 11 is a limitation summary for weld 3HP-365-9C (C05.021.052)

UT Pipe Weld Examination

Site/Unit:	Oconee / 3	Procedure:	NDE-600	Outage No.:	ONS3-22
Summary No.:	C05.011.004	Procedure Rev.:	16	Report No.:	UT-06-010
Workscope:	ISI	Work Order No.:	98737379	Page:	1 of 34

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.11.4 Location:

Drawing No.: 3LP-134 Description: Pipe to Valve 3LP-18

System ID: 53A

Component ID: C05.011.004 /3LP-134-103 Size/Length: N/A Thickness/Diameter: 1.125 / 10.0

Limitations: Yes - See Attached Limitation Report Start Time: 1328 Finish Time: 1342

Examination Surface: Inside [ ] Outside [✓] Surface Condition: GROUND

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

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32770 Surface Temp.: 76 °F

Cal. Report No.: CAL-06-029, CAL-06-030, CAL-06-031

Angle Used	0	45	45T	60	60L	
Scanning dB			30.3	43	48	

Indication(s): Yes [ ] No [✓] Scan Coverage: Upstream [✓] Downstream [✓] CW [✓] CCW [✓]

Comments:

FC 05-08

Results: Accept [✓] Reject [ ] Info [ ]

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

Examiner Leeper, Winfred C.	Level II	Signature Winfred C. Leeper	Date 2/2/2006	Reviewer Gary M Moss	Signature	Date 2-13-06
Examiner Griebel, David M.	Level II-N	Signature David M. Griebel	Date 2/2/2006	Site Review N/A	Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review C. L. Smith	Signature	Date 2/15/06

2 of 11

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 3LP-134-103 **Item No:** C05.011.004

remarks: Due to Valve to Reducer Configuration

[X] NO SCAN SURFACE BEAM DIRECTION

[ ] LIMITED SCAN [X] 1 [ ] 2 [ ] 1 [X] 2 [X] cw [X] ccw

FROM L ____ to L ____ INCHES FROM W0 CL to Beyond

ANGLE: [X] 0 [X] 45 [X] 60 other ____ FROM ____ DEG to ____ DEG

[ ] NO SCAN SURFACE BEAM DIRECTION

[ ] LIMITED SCAN [ ] 1 [ ] 2 [ ] 1 [ ] 2 [ ] cw [ ] ccw

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

ANGLE: [ ] 0 [ ] 45 [ ] 60 other ____ FROM ____ DEG to ____ DEG

[ ] NO SCAN SURFACE BEAM DIRECTION

[ ] LIMITED SCAN [ ] 1 [ ] 2 [ ] 1 [ ] 2 [ ] cw [ ] ccw

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

ANGLE: [ ] 0 [ ] 45 [ ] 60 other ____ FROM ____ DEG to ____ DEG

[ ] NO SCAN SURFACE BEAM DIRECTION

[ ] LIMITED SCAN [ ] 1 [ ] 2 [ ] 1 [ ] 2 [ ] cw [ ] ccw

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

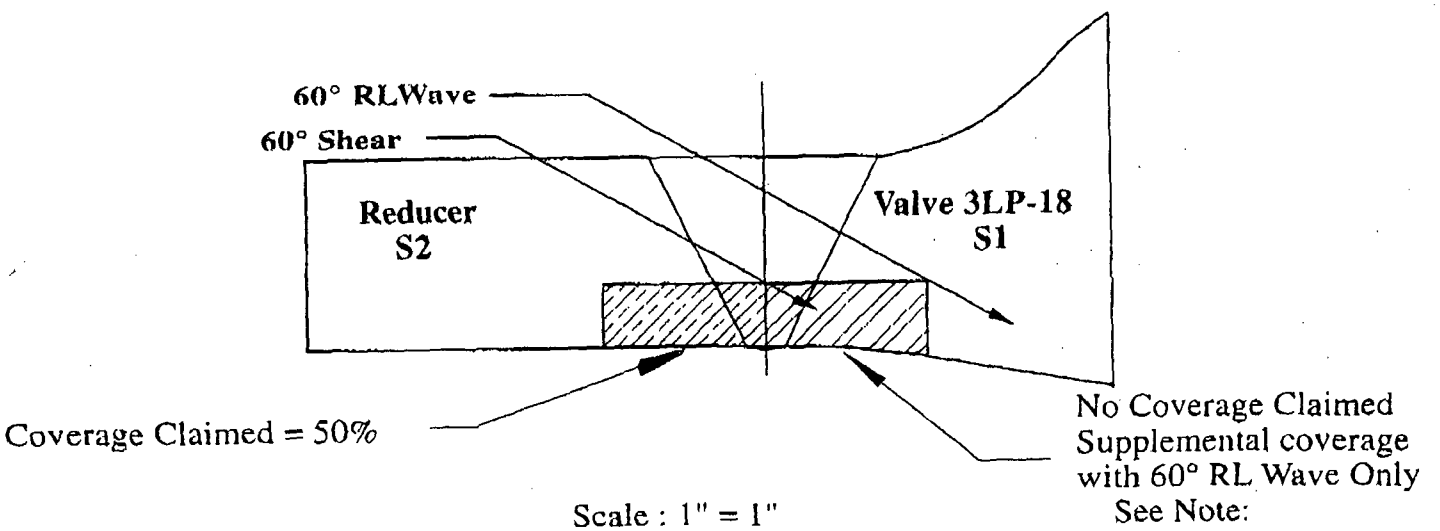
ANGLE: [ ] 0 [ ] 45 [ ] 60 other ____ FROM ____ DEG to ____ DEG

Sketch(s) attached [X] yes [ ] No

Prepared By: Winfred Leeper *Winfred C. Leeper* Level: II Date: 02-02-2006 Sheet 12 of 21

Reviewed By: *Gary A. Moss* Date: 2-13-06 Authorized Inspector: *[signature]* Date: 2/20/06

Item No. C05.011.004 **Weld No. 3LP-134-103**



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

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

"t" = **1.1** **Total Weld Volume**

1/3 "t" = **0.37** = (Weld + 1/4" ea. Side) x 1/3 "t" x Weld Length

Weld Length = **33.8** = **21.26** in^3

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

Aggregate Coverage Calculation

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

Total = 150 ÷ 4 = 37.5% Aggregate Coverage

Inspector / Date: JJ 2/6/06

4 of 11

Pg 4 of 4

LIMITED EXAMINATION COVERAGE CHECKLIST

ISI Summary No: C05.011.004

- ☑ Verify search unit wedge index to nose dimension;
- ☑ Draw the examination volume showing beam paths and obstructions including dimensions;
- ☑ Note the scale of the drawing;
- ☑ Calculate coverage in a detailed and orderly method;
- ☑ Complete "Limitation Work Sheet" and "Supplemental Report".

IWS NDE Level III [signature] III Date 2/6/06

QATS NDE Level III James J. McGillow Date 2-6-06

5 of 11

UT Pipe Weld Examination

Site/Unit: Oconee / 3 | Procedure: NDE-600 | Outage No.: ONS3-22

Summary No.: C05.021.052 | Procedure Rev.: 16 | Report No.: UT-06-011

Workscope: ISI | Work Order No.: 98737763 | Page: 1 of 35 CP 6/5/06

Code: 1998 thru 2000 Addenda | Cat./Item: C-F-1/C5.21.52 | Location:

Drawing No.: 3HP-365 | Description: Tee to Pipe

System ID: 51A

Component ID: C05.021.052 /3HP-365-9C | Size/Length: N/A | Thickness/Diameter: .674 / 4.0

Limitations: Yes- See Attached Limitation Report | Start Time: 1330 | Finish Time: 1405

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

Lo Location: 9.1.1.2 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 03125

Temp. Tool Mfg.: FISHER | Serial No.: MCNDE32770 | Surface Temp.: 73 °F

Cal. Report No.: CAL-06-032, CAL-06-033, CAL-06-034

Angle Used	0	45	45T	60	38	60L
Scanning dB				46	43	51

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

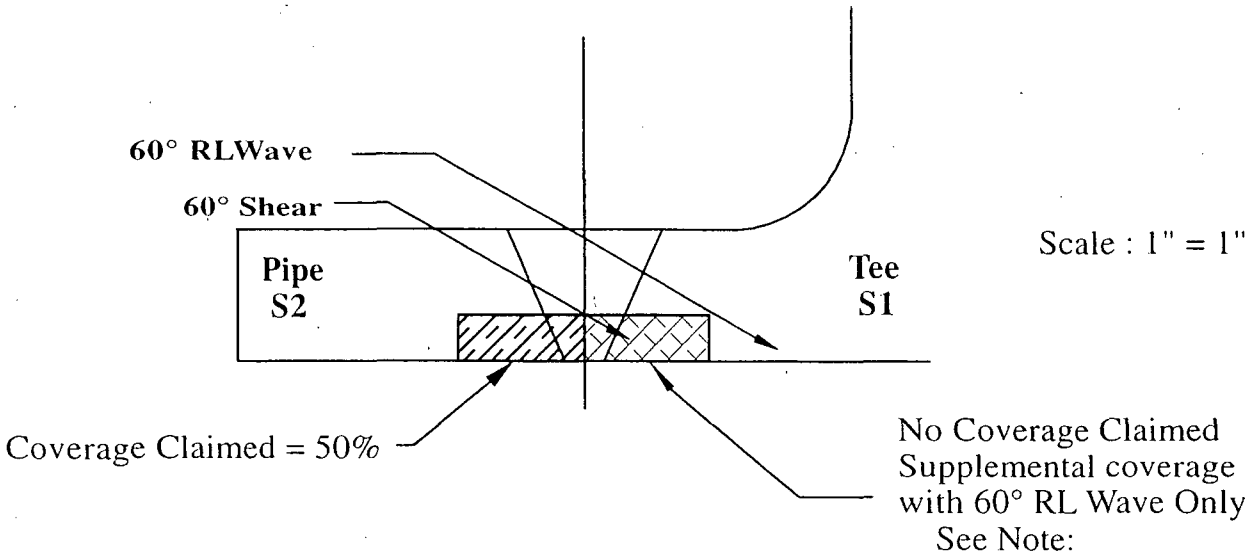
Comments:

FC 05-08

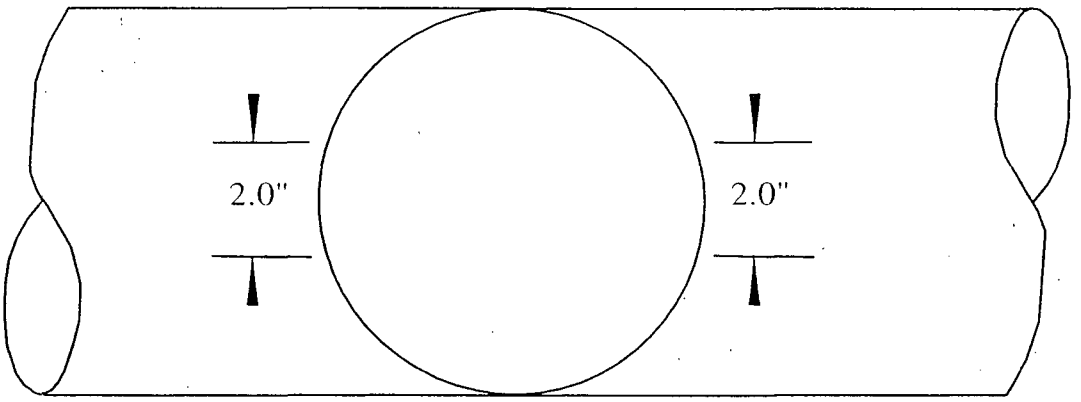
Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 89.4% | Reviewed Previous Data: Yes

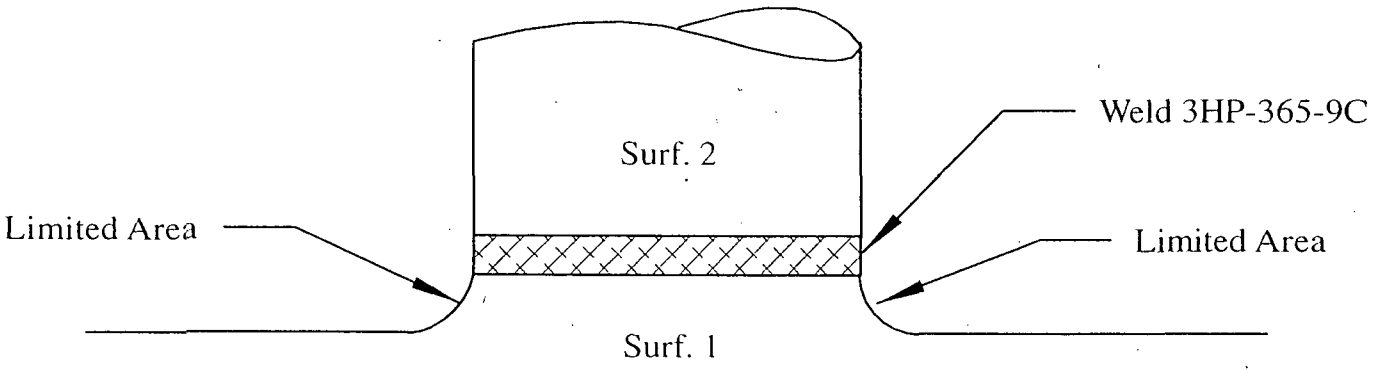
Examiner	Level II-N	Signature	Date	Reviewer		Signature	Date
Jolly, B. Dale		B. Dale Jolly	2/2/2006		Gary Moss		2-13-06
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Cochran, Lonnie D.		Lonnie D Cochran	2/2/2006	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							6/5/06



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



Plan View - Not to Scale



Side View - Not to Scale

Limited 2" on ea. side of Tee in throat area for a total of 4". From Lo + 3" to 5" and from Lo + 10.2" to 12.2" on Surface 1.

Inspector / Date : _____ III 2/6/06 Page 2 of 5

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 3HP-365-9C **Item No:** C05.021.052

remarks: Limitation Due to Tee Configuration.

☐ NO SCAN SURFACE BEAM DIRECTION

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

FROM L 3.0" to L 5.0" INCHES FROM W0 CL to .4"

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

☐ NO SCAN SURFACE BEAM DIRECTION

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

FROM L 10.2" to L 12.2" INCHES FROM W0 CL to .4"

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

☐ NO SCAN SURFACE BEAM DIRECTION

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

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

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

☐ NO SCAN SURFACE BEAM DIRECTION

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

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

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

Sketch(s) attached ☑ yes ☐ No

Prepared By: B. Dale Jolly Level: II Date: 02-02-2006 Sheet 23 of 35

Reviewed By: Gary Moss Date: 2-13-06 Authorized Inspector: Date: 2/15/06

Item No. : C05.021.052 Weld No. : 3HP-365-9C

PB 4 OF 5

% Coverage Calculations

Pipe Ø = **4.5**

"t" = **0.674**

1/3 "t" = **0.23**

Weld Length = **14.1**

Weld + 1/4" ea. Side = **1.30**

Length of Obstucted Area = **4.00**

Total Weld Volume 100%

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

= **4.22** in ^{3}

% of Length not Examined 100%

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

= **28.4** %

% of Length Examined 100%

= 100% - % not Examined

= **71.6** %

Axial Coverage from S2 - Pipe

= % of Volume Examined 100% + 50% of Obstructed Volume

= 71.6 + 14.2

= **85.8** %

Axial Coverage from S1 - Tee

= 100% of the Volume - % of the Volume not Examined

= 100 - 28.4

= **71.6** %

Circumferential Coverage from S3 & S4 both CW & CCW

= 100% of the Volume

= **100** %

Aggregate % of Coverage

= (S1 + S2 + S3 + S4) ÷ 4 = **89.4 % Coverage**

Inspector / Date: JH III 2/6/06 **Page** 4 **of** 5

9 of 11

pg 5 of 5

LIMITED EXAMINATION COVERAGE CHECKLIST

ISI Summary No: C05.021.052

- [x] Verify search unit wedge index to nose dimension;
- [x] Draw the examination volume showing beam paths and obstructions including dimensions;
- [x] Note the scale of the drawing;
- [x] Calculate coverage in a detailed and orderly method;
- [x] Complete "Limitation Work Sheet" and "Supplemental Report".

IWS NDE Level III [signature] III Date 2/6/06

QATS NDE Level III James J. McArdle Date 2-6-06

C05.011.004 3LP-134-103

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60° shear	Axial Pipe Side	33.77	50	50
No axial scan from the valve side				
45° shear	Clockwise both sides	33.77	50	50
45° shear	Counter clockwise both sides	33.77	50	50
			Aggregate = 37.5%	

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
60° RL	Axial pipe Side	33.77	50	0	50

C05.021.052 3HP-365-9C

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60° shear	Axial tee side	10.1	100	71.6
60 shear	Axial pipe side	14.1	71.6+14.2	85.8
45° shear	Clockwise pipe side	14.1	100	100
45° shear	Counter clockwise tee side	14.1	100	100
			Aggregate = 89.4%	

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
60° RL	Axial pipe side	4.0	14.2	0	14.2