Duke Energy®

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April 29, 2008

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

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Unit 2
Docket No: 50-270
Fourth Ten Year Inservice Inspection Interval
Request for Relief No. 08-ON-001

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-001 is to allow Duke Energy to take credit for seven (7) limited ultrasonic examinations on welds associated with various systems and components described in the attached request. The ultrasonic examination coverage of the subject Unit 2 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,

Dave Baxter,
Site Vice President

Enclosure

A047

NRR

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ISI Relief Request File
NRIA File/ELL EC05O
Document Control

Figure 4.1-2
Relief Request Review Form
(Add Additional Sheets as Necessary)

Page 1 of 1

Relief Request Serial Number: 08-ON-001 PIP Number(s): 05-8427

Station(s) (Check All that Apply):
- ☐ Oconee Unit(s): ☐ 1 ☒ 2 ☐ 3
- ☐ McGuire Unit(s): ☐ 1 ☐ 2
- ☐ Catawba Unit(s): ☐ 1 ☐ 2
- ☐ Other (List) _____ Unit(s): _____

Subject: Relief Request for Limited UT Exams Performed during 2 EOC 21

Prepared By (Print Name)	Group/Section	Signature	Date
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Contributor(s) (Print Name)	Specific Sections/Portions Provided by Contributor(s) and Sources of All Information/Data Provided
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Scott Manning	Portions of VII	R. Scott Manning	10-10-07
Gary Scarboro	I, II, Portions of IV, VI	Gary D. Scarboro	10/4/07
	Portions of VII, Cover Page		

Reviewed By (Print Name)	Group/Section	Signature	Date
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	QATS/NGO		
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Approved By (Print Name)	Group/Section	Signature	Date
Mark A Pyne	NTS/SXIP	Mark A Pyne	1/8/08

Final Review of Completed Submittal w/Cover Letter (Print Name)	Group/Section	Signature	Date
Larry Keith	(Preparer)	See attached email	4/17/08
Mark A. Pyne	(Approver)	See attached email	4/17/08
Gene Miller	~~MPS/NGO~~ SXIP	See attached Email	2/6/08
	Other (List) _____		

Relief Request 08-ON-001

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

Inservice Inspection Impracticality

Duke Energy Corporation

Oconee Nuclear Station – Unit 2 (EOC-21)

Fourth 10-Year Interval – Inservice Inspection Plan

Interval Start Date = 9-9-2004 Interval End Date = 9-9-2014

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

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

List Number	Weld ID	Item Number/Summary Number
1.	2-LDCA-IN-V1	B03.150.001
2.	2-LDCA-OUT-V2	B03.150.002
3.	2LP-148-16	C05.011.001
4.	2-51A-17-111	C05.021.026
5.	2HP-227-3	C05.021.027
6.	2HP-227-7	C05.021.028
7.	2-51A-28-67	C05.021.073

Attachment A contains the inspection data for these seven welds.

Items in this relief request were examined during August or November of 2005

I. ASME Code Component Affected

Weld ID = 2-LDCA-IN-V1
Item Number = B03.150.001
High Pressure Injection System
Letdown Cooler 2A Inlet Nozzle to Channel Body Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1998 Edition thru the 2000 Addenda

III. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-D
Item Number B3.150
Appendix III, III-4420 and III-4430
Fig. IWB-2500-7(c), 100% Volume Coverage of Examination Volume A-B-C-D-E-F-G-H

IV. Impracticality of Compliance

The Letdown Cooler Inlet Nozzle and Channel Head material is SA182 Grade T316L. This weld has a diameter of 3.0 inches and a wall thickness of .875 inches.

During the ultrasonic examination of the Inlet Nozzle to Channel Head weld, 29.26% coverage of the required examination volume was obtained. The percentage of coverage reported represents the aggregate coverage from all scans performed on the weld and adjacent base material. ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. Because of the weld configuration, these requirements could not be met. The coverage from each scan was as follows: 45° scan parallel to the weld covered 28.57%; 60° scan perpendicular to the weld covered 29.95%. Limited scanning was performed on the weld crown. Two beam path direction coverage is normally obtained using one half V-path shear waves from both sides of the weld or alternatively, full V-path shear waves from one side of the weld. However, the weld joint geometry, which is essentially a branch connection arrangement using a set-on nozzle, prevented scanning from both sides of the weld in two beam path directions and a full V-path examination from one side is prevented because of the stainless steel weld metal properties which cause excessive attenuation with shear waves. Substituting refracted longitudinal waves for shear waves is not possible because of the mode conversion occurring at the inside surface when using refracted longitudinal waves. In order to scan all of the required volume for this weld, the inlet nozzle 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.

V. Proposed Alternate Examinations or Testing

Radiography as an alternative is not feasible because access is not available for film placement. No alternative examinations are planned for the weld during the current inspection interval.

VI. Implementation Schedule and Duration

This request is for the duration of the fourth inservice inspection interval, currently scheduled to end on September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number B03.150 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII of the 1998 Edition with the 2000 Addenda. The ultrasonic procedures used complied with the requirements of ASME Section XI, Appendix III, 1998 Edition through the 2000 Addenda.

Duke will use Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to compliment the limited scan examination. The Code requires that a pressure test be performed after each refueling outage for Class 1. This test requires a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld, it would be detected and proper action taken. Specifically, operations performs a leakage calculation daily to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," are not exceeded and reactor building normal sump rate monitoring to 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. The weld/component was rigorously 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 exam, and the pressure testing (VT-2) exam during this outage, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

I. ASME Code Component Affected

Weld ID = 2-LDCA-OUT-V2
Item Number = B03.150.002
High Pressure Injection System
Letdown Cooler 2A Outlet Nozzle to Channel Body Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1998 Edition thru the 2000 Addenda

III. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-D
Item Number B3.150
Appendix III, III-4420 and III-4430
Fig. IWB-2500-7(c), 100% Volume Coverage of Examination Volume A-B-C-D-E-F-G-H

IV. Impracticality of Compliance

The Letdown Cooler Outlet Nozzle and Channel Head material is SA182 Grade T316L. This weld has a diameter of 3.0 inches and a wall thickness of .875 inches.

During the ultrasonic examination of the Outlet Nozzle to Channel Head weld, 29.26% coverage of the required examination volume was obtained. The percentage of coverage reported represents the aggregate coverage from all scans performed on the weld and adjacent base material. ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown in two directions. Because of the weld configuration, these requirements could not be met. The coverage from each scan was as follows: 45° scan parallel to the weld covered 28.57%; 60° scan perpendicular to the weld covered 29.95%. Limited scanning was performed on the weld crown. Two beam path direction coverage is normally obtained using one half V-path shear waves from both sides of the weld or alternatively, full V-path shear waves from one side of the weld. However, the weld joint geometry, which is essentially a branch connection arrangement using a set-on nozzle, prevented scanning from both sides of the weld in two beam path directions and a full V-path examination from one side is prevented because of the stainless steel weld metal properties which cause excessive attenuation with shear waves. Substituting refracted longitudinal waves for shear waves is not possible because of the mode conversion occurring at the inside surface when using refracted longitudinal waves. In order to scan all of the required volume for this weld, the outlet nozzle 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.

V. Proposed Alternate Examinations or Testing

Radiography as an alternative is not feasible because access is not available for film placement. No alternative examinations are planned for the weld during the current inspection interval.

VI. Implementation Schedule and Duration

This request is for the duration of the fourth inservice inspection interval, currently scheduled to end on September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number B03.150 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII of the 1998 Edition with the 2000 Addenda. The ultrasonic procedures used complied with the requirements of ASME Section XI, Appendix III, 1998 Edition through the 2000 Addenda.

Duke will use Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to compliment the limited scan examination. The Code requires that a pressure test be performed after each refueling outage for Class 1. This test requires a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld, it would be detected and proper action taken. Specifically, operations performs a leakage calculation daily to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," are not exceeded and reactor building normal sump rate monitoring to 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. The weld/component was rigorously 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 exam, and the pressure testing (VT-2) exam during this outage, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

I. ASME Code Component Affected

Weld ID = 2LP-148-16
Item Number = C05.011.001
Low Pressure Injection System
Pipe to Valve 2LP-47 Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 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 pipe material is SA 376/TP304 or TP316 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, 50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise, covered 80% of the weld and base material; 60° shear wave scan from the pipe side perpendicular to the weld covered 40% of the weld and base material. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the examination volume on the valve side from one direction perpendicular to the weld, but is not included in the coverage calculations because the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) mandate scanning from four directions. The limitation was caused by the taper on the valve side of the weld (which prevented scanning from that side) and the proximity of a 1 ½" branch connection. 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.

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 September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number C05.011 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 Liquid Penetrant (PT) examination (code required) on the C05.011 item and achieved 100% coverage. The result from the PT examination was acceptable.

In addition to the C05.011 weld of this relief request, there were two other C05.011 welds that surface (PT) and volumetric examinations were performed on during the outage. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of them. The two additional welds were from the same system as the C05.011 weld of this request. The examination and results of the two 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 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.

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. These tests require a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld it would be detected and proper action taken. Specifically, reactor building normal sump rate monitoring provides 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 the latest approved examination techniques and equipment. The weld/component was rigorously 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 and surface examinations performed during this outage, and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

I. ASME Code Component Affected

Weld ID = 2-51A-17-111
Item Number = C05.021.026
High Pressure Injection System
Pipe to Valve 2HP-128 Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 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 valve material is ASTM-A182/F316 forged 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 .531 inches.

During the ultrasonic examination of this weld, 37.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise, covered 50% of the weld and base material; 60° shear wave scan perpendicular to the weld covered 50% of the weld and base material from one axial direction. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the exam volume from one direction perpendicular to the weld but is not included in the coverage calculations because the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) mandate scanning from four directions. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

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 September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number C05.021 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 Liquid Penetrant (PT) examination (code required) on this C05.021 item and achieved 100% coverage. The result from the PT examination was acceptable.

In addition to the four C05.021 welds of this relief request, there were twelve additional C05.021 welds that surface (PT) and volumetric examinations were performed on during the outage. Eleven of the welds that were examined didn't identify any recordable indications and 100% coverage was obtained on each of them. One of the welds examined identified recordable indications (porosity & tungsten) during the volumetric examination that were acceptable per the 1998 Edition thru the 2000 Addenda of the Section XI Code, Paragraph IWB-3514.3, Table IWB-3514-2. 100% coverage was obtained on the weld that had recordable indications. The twelve additional welds were from the same system as the C05.021 weld of this request. The examination and results of the twelve 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 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.

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. These tests require a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld, it would be detected and proper action taken. Specifically, operations performs a leakage calculation daily to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," are not exceeded and visual observations during operator rounds to 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 the latest approved examination techniques and equipment. The weld/component was rigorously 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 and surface examinations performed during this outage, and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

I. ASME Code Component Affected

Weld ID = 2HP-227-3
Item Number = C05.021.027
High Pressure Injection System
Pipe to Valve 2HP-117 Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 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 valve material is ASTM-A182/F316 forged stainless steel and the pipe material is SA 376/TP 304 or 316 stainless steel seamless pipe. This weld has a diameter of 4.0 inches and a wall thickness of .531 inches.

During the ultrasonic examination of this weld, 37.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise, covered 50% of the weld and base material; 60° shear wave scan perpendicular to the weld covered 50% of the weld and base material from one axial direction. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the exam volume from one direction perpendicular to the weld but is not included in the coverage calculations because the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) mandate scanning from four directions. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

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 September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number C05.021 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 Liquid Penetrant (PT) examination (code required) on this C05.021 item and achieved 100% coverage. The result from the PT examination was acceptable.

In addition to the four C05.021 welds of this relief request, there were twelve additional C05.021 welds that surface (PT) and volumetric examinations were performed on during the outage. Eleven of the welds that were examined didn't identify any recordable indications and 100% coverage was obtained on each of them. One of the welds examined identified recordable indications (porosity & tungsten) during the volumetric examination that were acceptable per the 1998 Edition thru the 2000 Addenda of the Section XI Code, Paragraph IWB-3514.3, Table IWB-3514-2. 100% coverage was obtained on the weld that had recordable indications. The twelve additional welds were from the same system as the C05.021 weld of this request. The examination and results of the twelve 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 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.

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. These tests require a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld, it would be detected and proper action taken. Specifically, operations performs a leakage calculation daily to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," are not exceeded and visual observations during operator rounds to 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 the latest approved examination techniques and equipment. The weld/component was rigorously 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 and surface examinations performed during this outage, and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

I. ASME Code Component Affected

Weld ID = 2HP-227-7
Item Number = C05.021.028
High Pressure Injection System
Pipe to Valve 2HP-148 Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 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 valve material is ASTM-A182/F316 forged stainless steel and the pipe material is SA 376/TP 304 or 316 stainless steel seamless pipe. This weld has a diameter of 4.0 inches and a wall thickness of .531 inches.

During the ultrasonic examination of this weld, 37.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise, covered 50% of the weld and base material; 60° shear wave scan perpendicular to the weld covered 50% of the weld and base material from one axial direction. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the exam volume from one direction perpendicular to the weld, but is not included in the coverage calculations because the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) mandate scanning from four directions. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

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 September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number C05.021 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 Liquid Penetrant (PT) examination (code required) on this C05.021 item and achieved 100% coverage. The result from the PT examination was acceptable.

In addition to the four C05.021 welds of this relief request, there were twelve additional C05.021 welds that surface (PT) and volumetric examinations were performed on during the outage. Eleven of the welds that were examined didn't identify any recordable indications and 100% coverage was obtained on each of them. One of the welds examined identified recordable indications (porosity & tungsten) during the volumetric examination that were acceptable per the 1998 Edition thru the 2000 Addenda of the Section XI Code, Paragraph IWB-3514.3, Table IWB-3514-2. 100% coverage was obtained on the weld that had recordable indications. The twelve additional welds were from the same system as the C05.021 weld of this request. The examination and results of the twelve 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 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.

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. These tests require a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld, it would be detected and proper action taken. Specifically, operations performs a leakage calculation daily to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," are not exceeded and visual observations during operator rounds to 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 the latest approved examination techniques and equipment. The weld/component was rigorously 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 and surface examinations performed during this outage, and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

I. ASME Code Component Affected

Weld ID = 2-51A-28-67
Item Number = C05.021.073
High Pressure Injection System
Tee to Pipe Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 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 2.5 inches and a wall thickness of .375 inches.

During the ultrasonic examination of this weld, 79.15% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage with 45° and 60° shear wave 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 covered 72.2% of the weld and base material from two axial directions, (100% from the pipe side and 44% from the tee side at the 90° and 270° quadrants). A supplemental scan using a 70° shear scan search unit covered 55.6% of the weld and adjacent base material from one direction perpendicular to the weld including 100% of the inside surface within the area of interest. The limitation was caused by configuration of the tee which prevented scanning from that side in the 0° and 180° quadrants. 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 around the full circumference, which is impractical. There were no recordable indications found during the inspection of this weld.

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 September 9, 2014.

VII. Justification for Granting Relief

Ultrasonic examination of the weld for item number C05.021 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 Liquid Penetrant (PT) examination (code required) on this C05.021 item and achieved 100% coverage. The result from the PT examination was acceptable.

In addition to the four C05.021 welds of this relief request, there were twelve additional C05.021 welds that surface (PT) and volumetric examinations were performed on during the outage. Eleven of the welds that were examined didn't identify any recordable indications and 100% coverage was obtained on each of them. One of the welds examined identified recordable indications (porosity & tungsten) during the volumetric examination that were acceptable per the 1998 Edition thru the 2000 Addenda of the Section XI Code, Paragraph IWB-3514.3, Table IWB-3514-2. 100% coverage was obtained on the weld that had recordable indications. The twelve additional welds were from the same system as the C05.021 weld of this request. The examination and results of the twelve 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. However, the shear wave is useable when the sound beam passes through the root of the weld at a high angle such as 70°. Duke uses a 70° shear wave angle beam to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch.

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. These tests require a VT-2 visual examination for evidence of leakage. This testing contributes to the reasonable assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld it would be detected and proper action taken. Specifically, operations performs a leakage calculation daily to assure system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," are not exceeded and visual observations during operator rounds to 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 the latest approved examination techniques and equipment. The weld/component was rigorously 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 and surface examinations performed during this outage, and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

REQUEST RELIEF 08-ON-001

ATTACHMENT A

Total Number of Pages = 52

Pages 1-16 are for weld 2-LDCA-IN-V1 (B03.150.001)
Pages 17-32 are for weld 2LDCA-OUT-V2 (B03.150.002)
Pages 33-36 are for weld 2LP-148-16 (C05.011.001)
Pages 37-40 are for weld 2-51A-17-111 (C05.021.026)
Pages 41-44 are for weld 2HP-227-3 (C05.021.027)
Pages 49-56 are for weld 2HP-227-7 (C05.021.028)
Pages 57-64 are for weld 2-51A-28-67 (C05.021.073)

UT Vessel Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-3630	Outage No.:	ONS2-21
Summary No.:	B03.150.001	Procedure Rev.:	0	Report No.:	UT-05-322
Workscope:	ISI	Work Order No.:	98705177	Page:	1 of 16

Code: 1998 thru 2000 Addenda Cat./Item: B-D- /B3.150.1 Location: N/A

Drawing No.: 1-44773-1 Description: Nozzle to Channel Body

System ID: 51A

Component ID: B03.150.001 /2-LDCA-IN-V1 Size/Length: N/A Thickness/Diameter: .875 / 3.0

Limitations: Yes-See Attached Limitation Report Start Time: 1056 Finish Time: 1110

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

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32769 Surface Temp.: 78 °F

Cal. Report No.: CAL-05-339, CAL-05-340, CAL-05-341, CAL-05-342

Angle Used	0	45	45T	60	60T	45RL
Scanning dB		38.1	49.5	75.4		73.3

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

Comments:

Scanning dB at Ref. to obtain a 2:1 signal to noise ratio.

SERIAL # 1-44773-1

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-29.26% Reviewed Previous Data: Yes

Examiner Jones, Russel	Level II	Signature	Date 11/1/2005	Reviewer	Signature Dan Moss	Date 11-5-05
Examiner Mauldin, Larry E.	Level II-N	Signature Larry E Mauldin	Date 11/1/2005	Site Review N/A	Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review	Signature Nancy C Ritchel Stoughton	Date 11/6/05

Duke Energy

Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit:	Oconee / 2	Procedure:	NDE-3630	Outage No.:	ONS2-21
Summary No.:	B03.150.001	Procedure Rev.:	0	Report No.:	UT-05-322
Workscope:	ISI	Work Order No.:	98705177	Page:	2 of 16

0 deg Planar

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

45 deg

Scan 1 100.000 % Length X 35.900 % volume of length / 100 = 35.900 % total for Scan 1

Scan 2 100.000 % Length X 15.600 % volume of length / 100 = 15.600 % total for Scan 2

Scan 3 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 3

Scan 4 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 4

Add totals and divide by # scans = 28.575 **% total for 45 deg**

Other deg 60

Scan 1 100.000 % Length X 46.600 % volume of length / 100 = 46.600 % total for Scan 1

Scan 2 100.000 % Length X 10.400 % volume of length / 100 = 10.400 % total for Scan 2

Scan 3 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 3

Scan 4 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 4

Add totals and divide by # scans = 29.950 **% total for** 60 **deg**

Percent complete coverage

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

29.263 **% 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. Bruce III Date: 11/03/05

Duke Energy.

Supplemental Report

Report No.: UT-05-322

Page: 3 of 16

Summary No.: B03.150.001

Sketch or Photo:

Comments: AVERAGE OF EXAM AREAS OF AXIAL/CIRC. CONTOURS USED TO DETERMINE ACTUAL EXAM AREA.

ACTUAL EXAM AREA: (Ax) 3.43in² + (C) 2.077in² = 5.507in²/2 = 2.754in²

SCAN	AXIAL AREA	CIRC. AREA	AVERAGE	PERCENT (AVE/ACT.) x 100
45° - 1	1.124in²	.856in²	.99in²	35.9%
- 2	.473in²	.385in²	.429in²	15.6%
- 3	1.29in²	.44in²	.865in²	31.4%
- 4	1.29in²	.44in²	.865in²	31.4%
60° - 1	1.455in²	1.111in²	1.283in²	46.6%
- 2	.356in²	.219in²	.288in²	10.4%
- 3	1.29in²	.44in²	.865in²	31.4%
- 4	1.29in²	.44in²	.865in²	31.4%

Blue Energy

Supplemental Report

Report No.: UT-05-322

Page: 4 of 16

Summary No.: B03.150.001

Sketch or Photo:

EXAM AREA:

ABCD = .5" X .875" = .4375 ^{2} IN.

CDE = $\frac{.875" \times 1.4"}{2}$ = .6125 ^{2} IN.

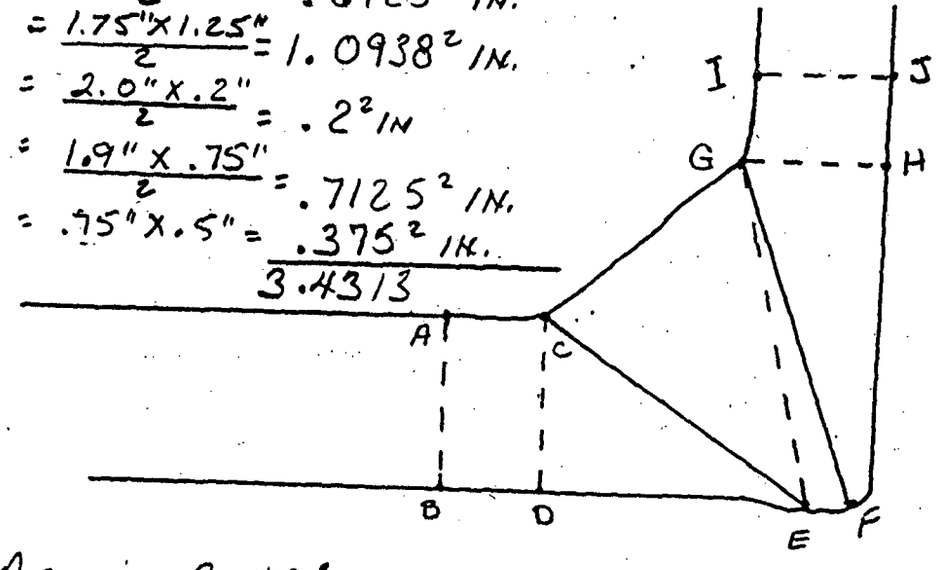
CEG = $\frac{1.75" \times 1.25"}{2}$ = 1.0938 ^{2} IN.

EFG = $\frac{2.0" \times .2"}{2}$ = .2 ^{2} IN

GHF = $\frac{1.9" \times .75"}{2}$ = .7125 ^{2} IN.

GHIJ = .75" X .5" = .375 ^{2} IN.

3.4313



TOTAL EXAM AREA = 3.43 ^{2} IN.

2-LDCA-IN -V1

SCALE: FULL

Duke Energy

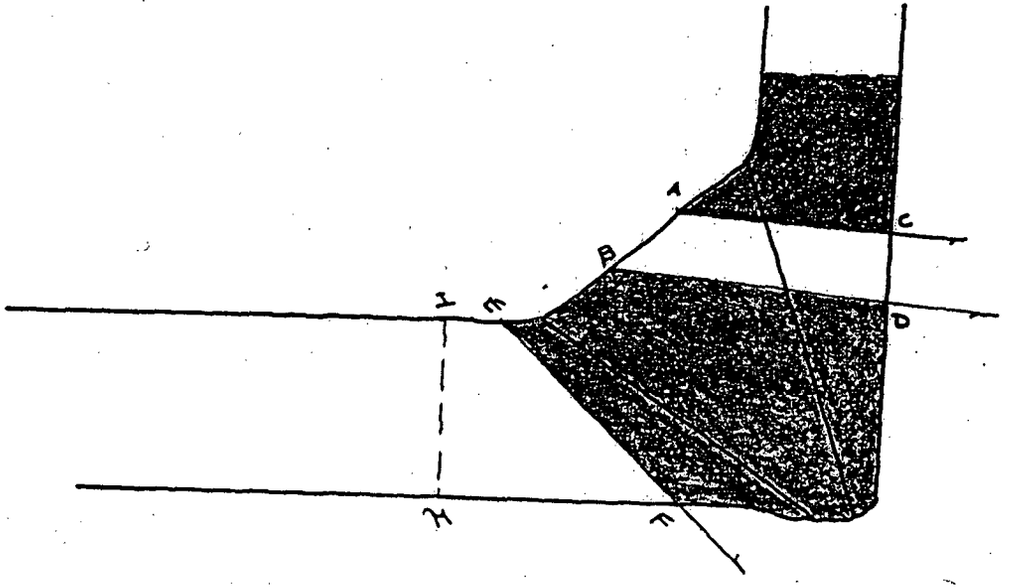
Supplemental Report

Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA IN - V1

AXIAL CONTOUR



AREA OF COVERAGE

ABCD: $\left(\frac{1.1in + 1.45in}{2}\right).35in = .446in^2$

EFHI: $\left(\frac{.3in + 1.25in}{2}\right).875in = .678in^2$

TOTAL AREA = $1.124in^2$

SCALE: FULL

45° AXIAL - SCAN 1

FULL COVERAGE
NO COVERAGE

Supplemental Report

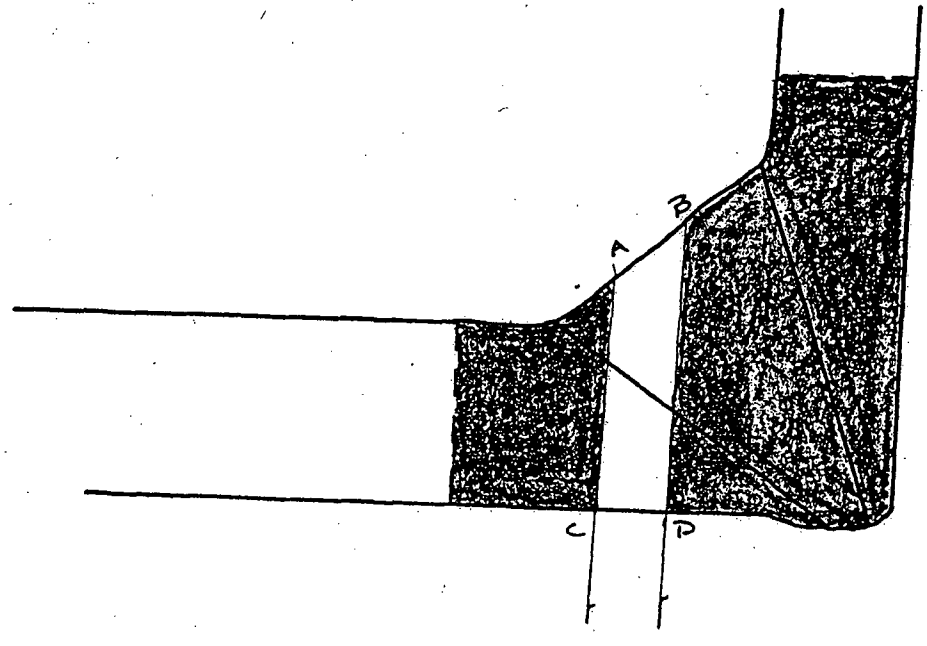
Report No.: UT-05-322

Page: 6 of 16

Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA IN -V1



AXIAL CONTOUR

AREA OF COVERAGE

ABCE: $\left(\frac{1.5in + 1.2in}{2}\right) .35in = .473in^2$

45° AXIAL - SCAN 7

SCALE: FULL

FULL COVERAGE

NO COVERAGE

Duke Energy

Supplemental Report

Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA-IN -V1

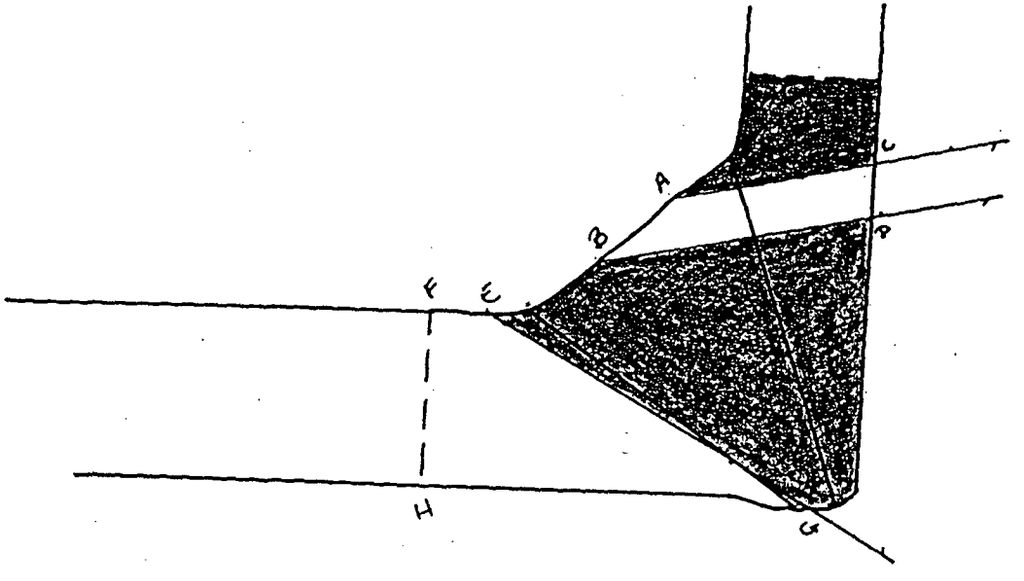
AXIAL CONTOUR

AREA OF COVERAGE

ABCD: $\left(\frac{1.45in + 1.1in}{2}\right) .3in = .383$

EFGH: $\left(\frac{.35in + 2.1in}{2}\right) .875in^2 = 1.072$

TOTAL AREA = 1.455



60° AXIAL - SCAN 1

SCALE: FULL

FULL COVERAGE

NO COVERAGE

Duke Energy

Supplemental Report

Report No.: UT-05-322

Page: 8 of 16

Summary No.: B03.150.001

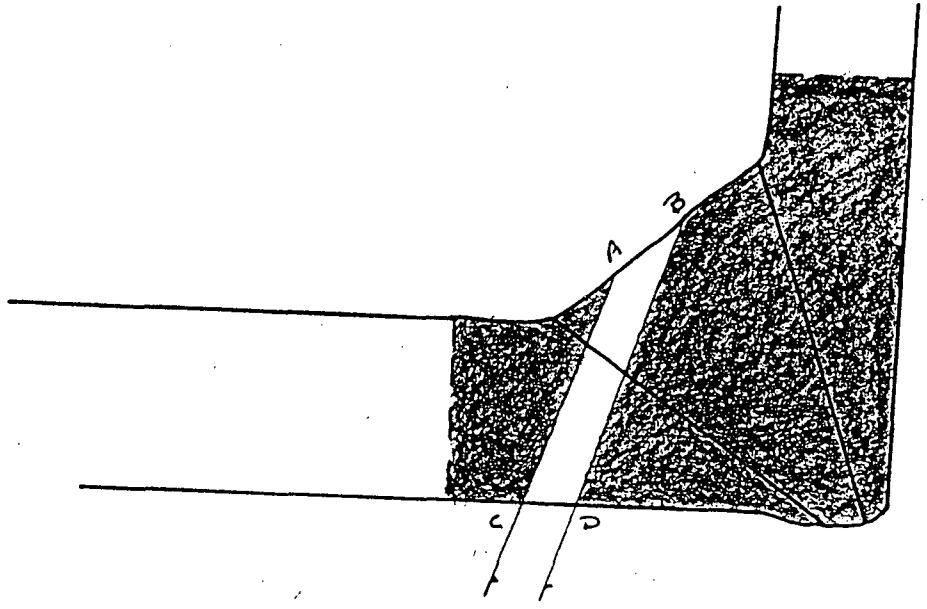
Sketch or Photo:

Comments: 2-LDCA-IN -Vi

AXIAL CONTOUR

AREA OF COVERAGE

ABCD: $\left(\frac{1.25in + 1.6in}{2}\right) .25in = .356in^2$



60 AXIAL - SCAN 2

SCALE: FULL

FULL COVERAGE

NO COVERAGE

Baker Energy

Supplemental Report

Summary No.: B03.150.001

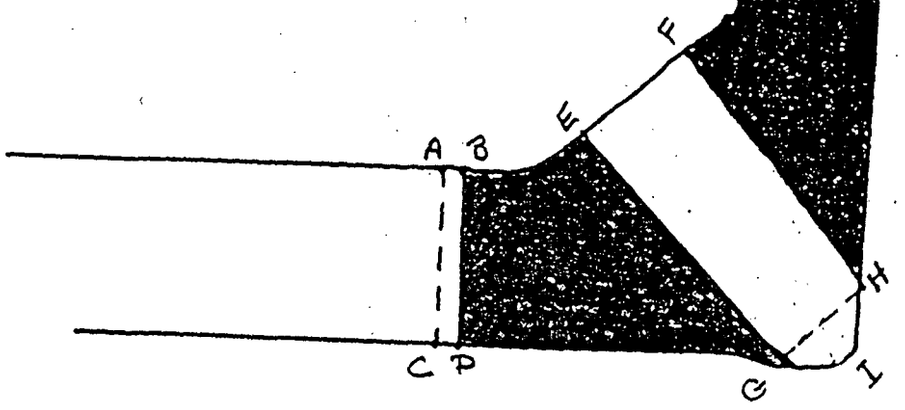
Sketch or Photo:

Comments: CIRC. SCAN:

AREA of COVERAGE:

ABCD = .875" X .1" = .0875² IN.
EFGH = 1.6" X .7" = 1.12² IN.
GHI = .4" X .4" / 2 = .08² IN.

} 1.29² IN. COVERAGE



NOTE: 45° & 60° CIRC. SCANS COVER IDENTICAL AREAS.

SCALE: FULL

2-LDCA-IN -V1

FULL COVERAGE
NO COVERAGE

Summary No.: B03.150.001

Sketch or Photo:

Comments:

EXAM AREA: ABCD = .5" X .875" = .4375 ^{2} IN.

CDE = $\frac{1.15" \times .35"}{2}$ = .2013 ^{2} IN.

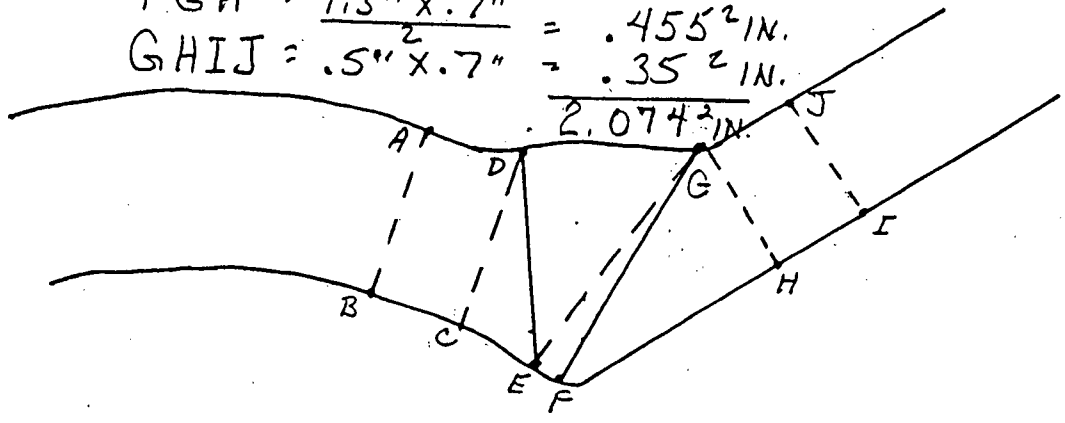
DEG = $\frac{1.4" \times .7"}{2}$ = .49 ^{2} IN.

EFG = $\frac{1.4" \times .2"}{2}$ = .14 ^{2} IN.

FGH = $\frac{1.3" \times .7"}{2}$ = .455 ^{2} IN.

GHIJ = .5" X .7" = .35 ^{2} IN.

2.0743 ^{2} IN.



TOTAL EXAM AREA: 2.07 ^{2} IN.

SCALE: FULL

2-LDCA-IN -V1

Duke Energy

Supplemental Report

Report No.: UT-05-322

Page: 11 of 16

Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA-IN. -V1

CIRC. CONTOUR

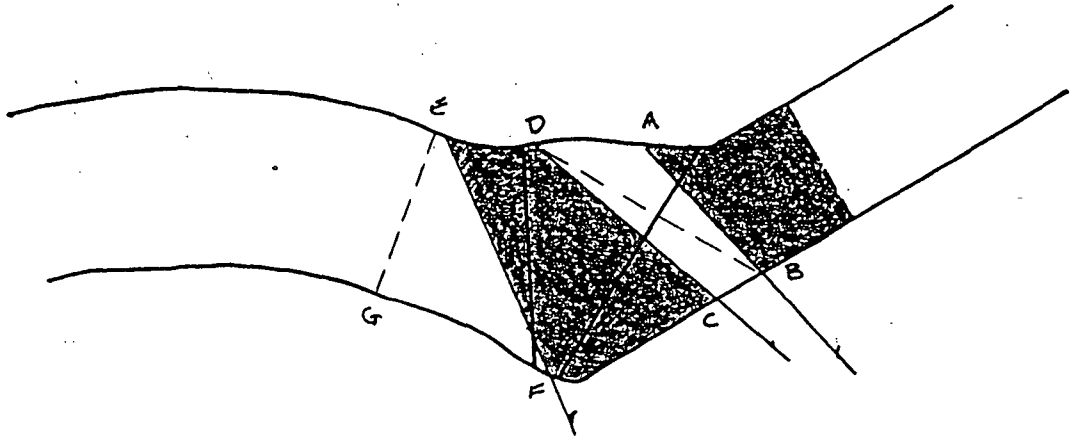
AREA OF COVERAGE

ABD: $\frac{.9in \times .6in}{2} = .27in^2$

BCD: $\frac{1.2in \times .25in}{2} = .15in^2$

EGF: $\frac{1.0in \times .875in}{2} = .436in^2$

TOTAL AREA = $.856in^2$



45 AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-322

Page: 12 of 16

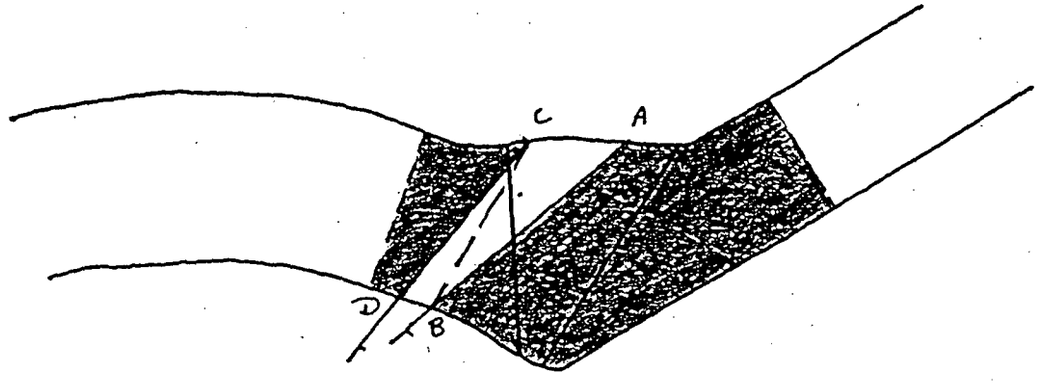
Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA-IN -V1

CIRC. CONTOUR

AREA OF COVERAGE



ABC: $\frac{1.1in \times .5in}{2} = .275in^2$

BCD: $\frac{2in \times 1.1in}{2} = 1.1in^2$

TOTAL AREA = $1.375in^2$

SCALE: FULL

45° AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

Duke Energy

Supplemental Report

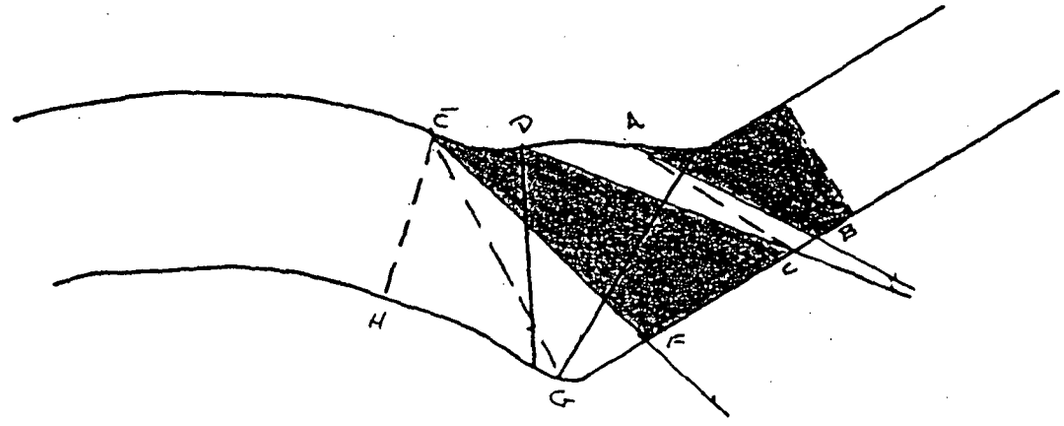
Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA-IN V1

CIRC. CONTOUR

AREA OF COVERAGE



ABC: $\frac{1.0in \times .1in}{2} = .05in^2$

ACD: $\frac{1.0in \times .55in}{2} = .275in^2$

EFG: $\frac{1.4in \times .5in}{2} = .35in^2$

EGH: $\frac{1.0in \times .875in}{2} = .4375in^2$

TOTAL AREA: $1.111in^2$

60° AXIAL - SCAN 1

FULL COVERAGE
NO COVERAGE
SCALE: FULL

Energy.

Supplemental Report

Report No.: UT-05-322

Page: 14 of 16

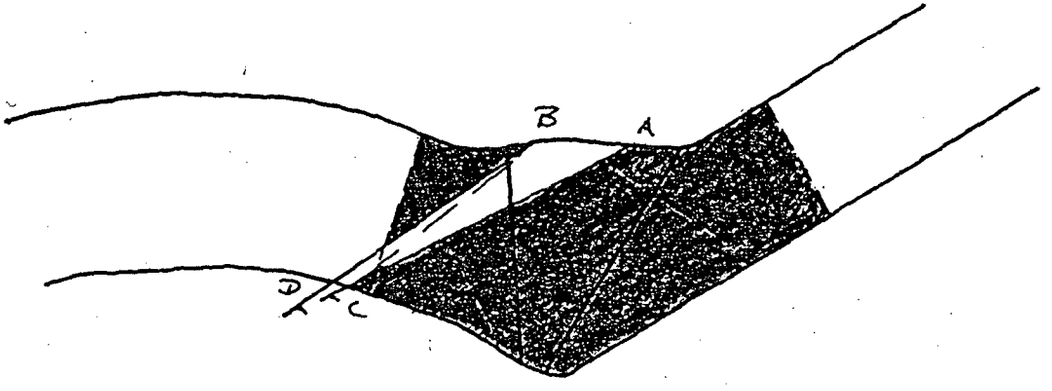
Summary No.: B03.150.001

Sketch or Photo:

Comments: 2-LDCA-IN -V1

CIRC. CONTOUR

AREA OF COVERAGE



ABC: $\frac{1.25in \times .25in}{2} = .156in^2$

BCD: $\frac{.1in \times 1.25in}{2} = .063in^2$

TOTAL AREA = $.219in^2$

60° AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-322

Summary No.: B03.150.001

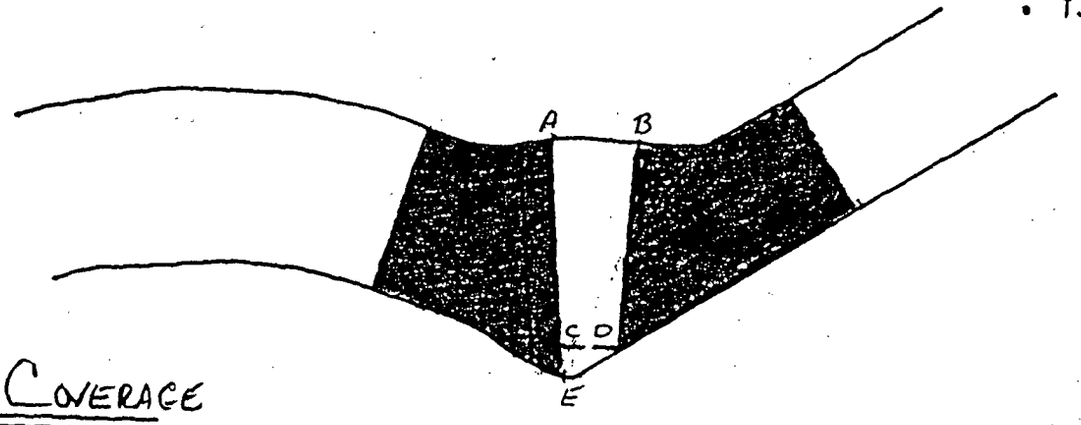
Sketch or Photo:

Comments: CIRC. SCAN:

AREA of COVERAGE: $ABCD = \frac{.1}{2}(.45" + .3") = .4125^2$ IN.

$CDE = \frac{.3" \times .15"}{2} = .0225^2$ IN.

$.435^2$ IN. = $.44^2$ IN.



$.44^2$ IN. COVERAGE

NOTE: 45° & 60° CIRC. SCANS COVER IDENTICAL AREAS.

FULL COVERAGE

NO COVERAGE

SCALE: FULL

16 + 52

DUKE POWER COMPANY
ISI LIMITATION REPORT

Component/Weld ID: 2-LDCA-IN-V1 **Item No:** B03.150.001

remarks: Due to branch connection configuration.

☒ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☒ 2	☒ 1 ☐ 2 ☒ cw ☒ ccw	
FROM L N/A to L N/A		INCHES FROM W0 .5" to Beyond	
ANGLE: ☐ 0 ☒ 45 ☒ 60 other ____		FROM 0 DEG to 360 DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM W0 ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____		FROM ____ DEG to ____ DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM W0 ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____		FROM ____ DEG to ____ DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM W0 ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____		FROM ____ DEG to ____ DEG	

Sketch(s) attached ☒ yes ☐ No

Prepared By: Larry Mauldin *Larry Mauldin* Level: II Date: 11/01/2005 Sheet 16 of 16

Reviewed By: *David K. [illegible] III* Date: 11/03/05 Authorized Inspector: *Nancy C Ritchie Slaughter* Date: 11/6/05

17 + 52

UT Vessel Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-3630	Outage No.:	ONS2-21
Summary No.:	B03.150.002	Procedure Rev.:	0	Report No.:	UT-05-323
Workscope:	ISI	Work Order No.:	98705177	Page:	1 of 16

Code: 1998 thru 2000 Addenda Cat./Item: B-D- /B3.150.2 Location: N/A

Drawing No.: 1-44773-1 Description: Nozzle to Channel Body

System ID: 51A

Component ID: B03.150.002 /2-LDCA-OUT-V2 Size/Length: N/A Thickness/Diameter: .875 / 3.0

Limitations: Yes-See Attached Limitation Report Start Time: 1055 Finish Time: 1109

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

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32769 Surface Temp.: 78 °F

Cal. Report No.: CAL-05-339, CAL-05-340, CAL-05-341, CAL-05-342

Angle Used	0	45	45T	60	60T	45RL
Scanning dB		38.1	49.5	75.4		73.3

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

Comments:

Scanning db at ref. to obtain a 2:1 signal to noise ratio.

SERIAL # 1-44773-1

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-29.26% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Jones, Russel			11/1/2005				11-5-05
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Mauldin, Larry E.			11/1/2005	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							11/6/05

Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit:	Oconee / 2	Procedure:	NDE-3630	Outage No.:	ONS2-21
Summary No.:	B03.150.002	Procedure Rev.:	0	Report No.:	UT-05-323
Workscope:	ISI	Work Order No.:	98705177	Page:	2 of 16

0 deg Planar

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

45 deg

Scan 1	100.000	% Length X	35.900	% volume of length / 100 =	35.900	% total for Scan 1
Scan 2	100.000	% Length X	15.600	% volume of length / 100 =	15.600	% total for Scan 2
Scan 3	100.000	% Length X	31.400	% volume of length / 100 =	31.400	% total for Scan 3
Scan 4	100.000	% Length X	31.400	% volume of length / 100 =	31.400	% total for Scan 4

Add totals and divide by # scans = 28.575 **% total for 45 deg**

Other deg 60

Scan 1	100.000	% Length X	46.600	% volume of length / 100 =	46.600	% total for Scan 1
Scan 2	100.000	% Length X	10.400	% volume of length / 100 =	10.400	% total for Scan 2
Scan 3	100.000	% Length X	31.400	% volume of length / 100 =	31.400	% total for Scan 3
Scan 4	100.000	% Length X	31.400	% volume of length / 100 =	31.400	% total for Scan 4

Add totals and divide by # scans = 29.950 **% total for** 60 **deg**

Percent complete coverage

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

29.263 **% Total for complete exam**

Note:

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

Site Field Supervisor: _____ Date: 11/03/05

Duke Energy.

Supplemental Report

Summary No.: B03.150.002

Sketch or Photo:

Comments: AVERAGE OF EXAM AREAS OF AXIAL/CIRC. CONTOURS USED TO DETERMINE ACTUAL EXAM AREA.

ACTUAL EXAM AREA: (Ax) $3.43in^2$ + (C) $2.077in^2$ = $5.507in^2/2 = 2.754in^2$

SCAN	AXIAL AREA	CIRC. AREA	AVERAGE	PERCENT (AVE/ACT.) x 100
45° - 1	$1.124in^2$	$.856in^2$	$.99in^2$	35.9%
- 2	$.473in^2$	$.385in^2$	$.429in^2$	15.6%
- 3	$1.29in^2$	$.44in^2$	$.865in^2$	31.4%
- 4	$1.29in^2$	$.44in^2$	$.865in^2$	31.4%
60° - 1	$1.455in^2$	$1.111in^2$	$1.283in^2$	46.6%
- 2	$.356in^2$	$.219in^2$	$.288in^2$	10.4%
- 3	$1.29in^2$	$.44in^2$	$.865in^2$	31.4%
- 4	$1.29in^2$	$.44in^2$	$.865in^2$	31.4%

Duke Energy

Supplemental Report

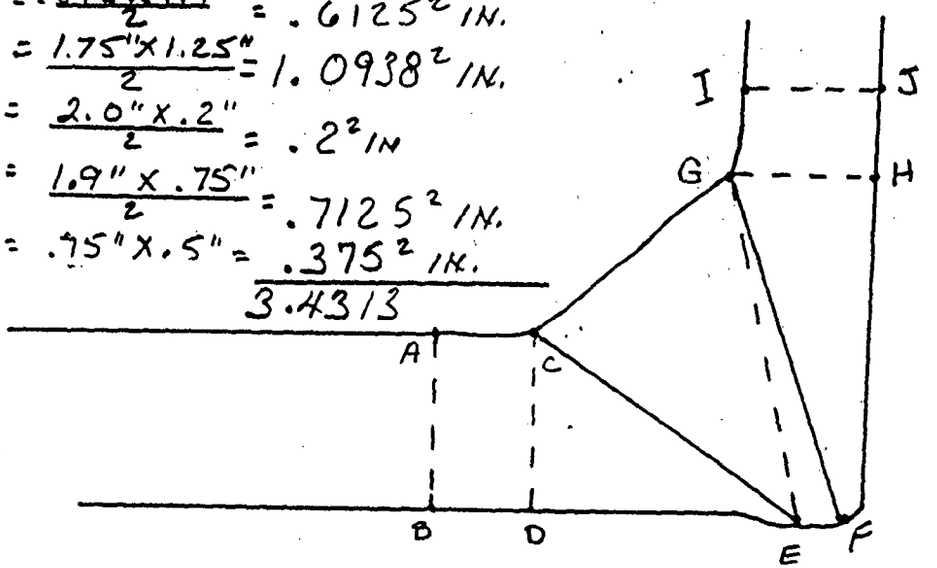
Summary No.: B03.150.002

Sketch or Photo:

Comments:

EXAM AREA:

ABCD = .5" X .875" = .4375 ^{2} IN.
CDE = $\frac{.875" \times 1.4"}{2}$ = .6125 ^{2} IN.
CEG = $\frac{1.75" \times 1.25"}{2}$ = 1.0938 ^{2} IN.
EFG = $\frac{2.0" \times .2"}{2}$ = .2 ^{2} IN
GHF = $\frac{1.9" \times .75"}{2}$ = .7125 ^{2} IN.
GHIJ = .75" X .5" = .375 ^{2} IN.
3.4313



TOTAL EXAM AREA = 3.43 ^{2} IN.

2-LDCA.-OUT -V2

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

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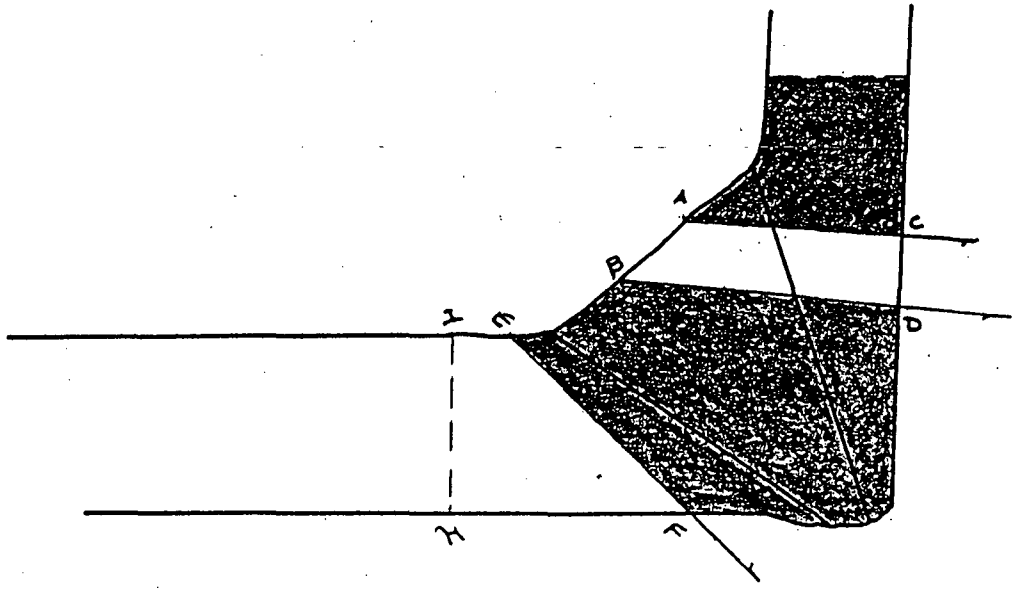
Summary No.: B03.150.002

Sketch or Photo:

Comments: 2-LDCA-OUT -V2

AXIAL CONTOUR



AREA OF COVERAGE

ABCD: $\left(\frac{1.1in + 1.45in}{2}\right).35in = .446in^2$

EFHI: $\left(\frac{3in + 1.25in}{2}\right).875in = .678in^2$

TOTAL AREA = $1.124in^2$

45° AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

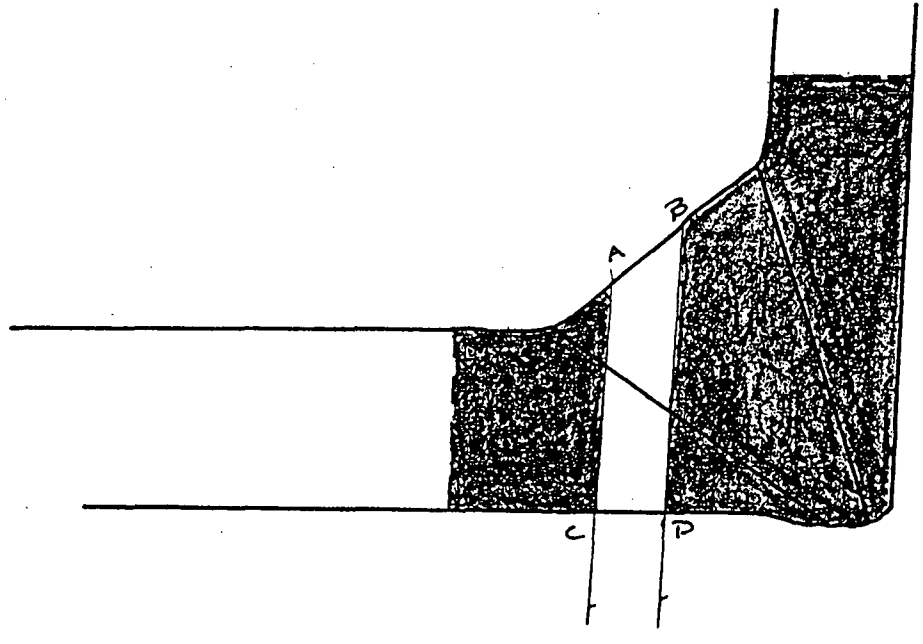
Report No.: UT-05-323

Page: 6 of 16

Summary No.: B03.150.002

Sketch or Photo:

Comments: 2-LDCA-OUT -V2



AXIAL CONTOUR

AREA OF COVERAGE

ABCE: $\frac{(1.5in + 1.2in)}{2} \cdot .35in = .473in^2$

45° AXIAL - SCAN 7

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy.

Supplemental Report

Report No.: UT-05-323

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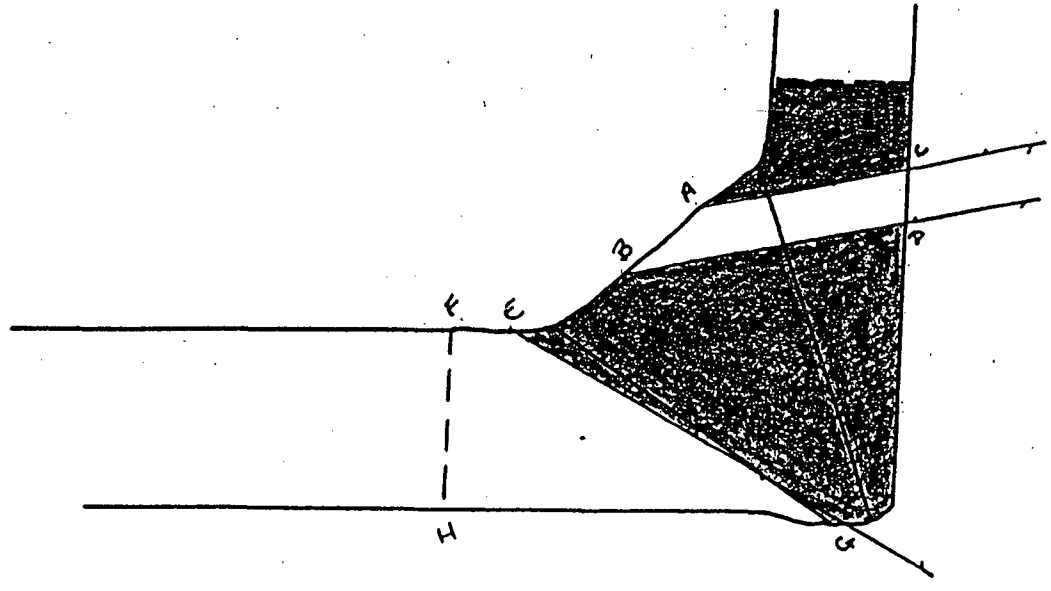
Summary No.: B03.150.002

Sketch or Photo:

Comments: 2-LDCA-OUT -V2

AXIAL CONTOUR

AREA OF COVERAGE



ABCD: $\left(\frac{1.45in + 1.1in}{2}\right) 3in = .383in^2$

EFGH: $\left(\frac{.35in + 2.1in}{2}\right) .875in = 1.072in^2$

TOTAL AREA = $1.455in^2$

60° AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

Page: 8 of 16

Summary No.: B03.150.002

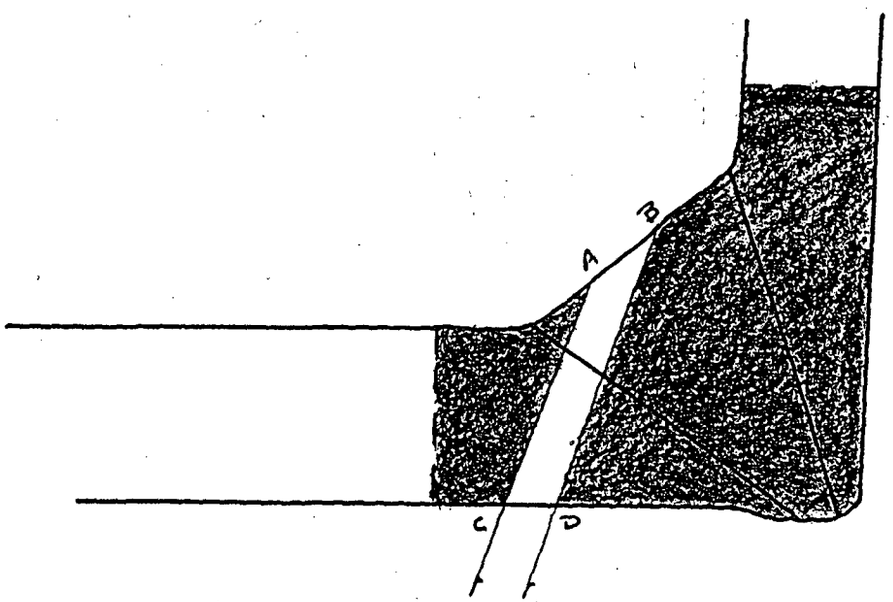
Sketch or Photo:

Comments: 2-LDCA-OUT -V2

AXIAL CONTOUR

AREA OF COVERAGE

ABCD: $\left(\frac{1.25in * 1.6in}{2}\right) .25in = .356in^2$



60 AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy.

Supplemental Report

Report No.: UT-05-323

Page: 9 of 16

Summary No.: B03.150.002

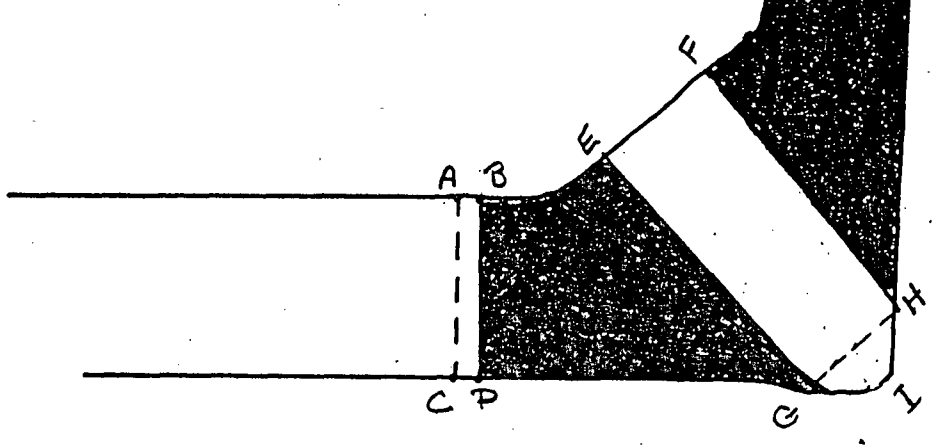
Sketch or Photo:

Comments: CIRC. SCAN:

AREA of COVERAGE:

ABCD = .875" X .1" = .0875² IN.
EFGH = 1.6" X .7" = 1.12² IN.
GHI = .4" X .4" / 2 = .08² IN.

} 1.29² IN. COVERAGE



NOTE: 45° & 60° CIRC. SCANS COVER IDENTICAL AREAS.

2-LDCA-OUT -V2

FULL COVERAGE
NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

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Summary No.: B03.150.002

Sketch or Photo:

Comments:

EXAM AREA: ABCD = .5" X .875" = .4375 ^{2} IN.

CDE = $\frac{1.15" \times .35"}{2}$ = .2013 ^{2} IN.

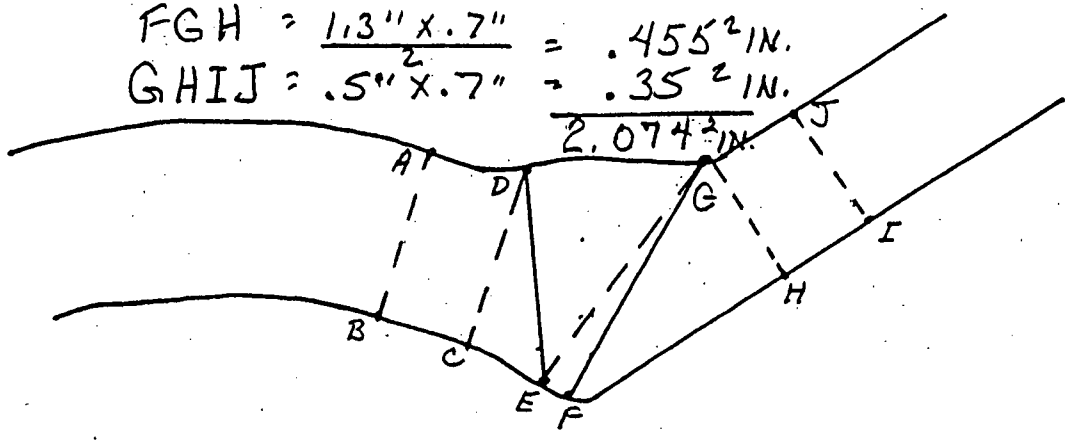
DEG = $\frac{1.4" \times .7"}{2}$ = .49 ^{2} IN.

EFG = $\frac{1.4" \times .2"}{2}$ = .14 ^{2} IN.

FGH = $\frac{1.3" \times .7"}{2}$ = .455 ^{2} IN.

GHIJ = .5" X .7" = .35 ^{2} IN.

2.074 ^{2} IN.



TOTAL EXAM AREA: 2.07 ^{2} IN.

SCALE: FULL

Duke Energy.

Supplemental Report

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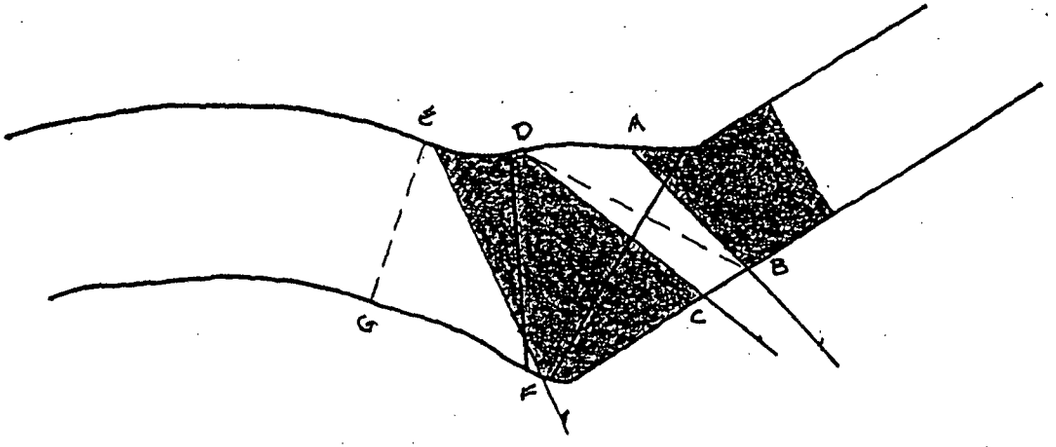
Sketch or Photo:

Comments: 2-LDCA - OUT :V2



CIRC. CONTOUR

AREA OF COVERAGE

ABD: $\frac{.9in \times .6in}{2} = .27in^2$

BCD: $\frac{1.2in \times .25in}{2} = .15in^2$

EGF: $\frac{1.0in \times .815in}{2} = .436in^2$

TOTAL AREA = $.856in^2$

45 AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

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Summary No.: B03.150.002

Sketch or Photo:

Comments: 2-LDCA-OUT -V2

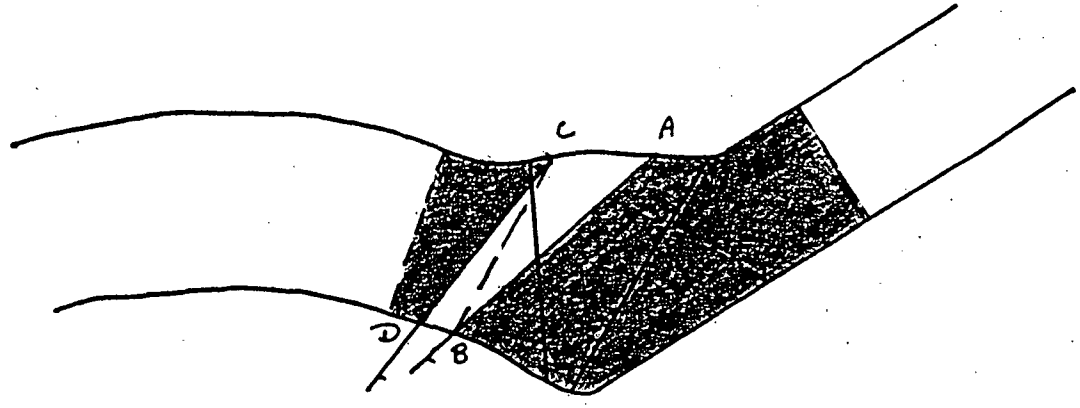
CIRC. CONTOUR

AREA OF COVERAGE

ABC: $\frac{1.1in \times .5in}{2} = .275in^2$

BCD: $\frac{.2in \times 1.1in}{2} = .11in^2$

TOTAL AREA = $.385in^2$



45° AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

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Summary No.: B03.150.002

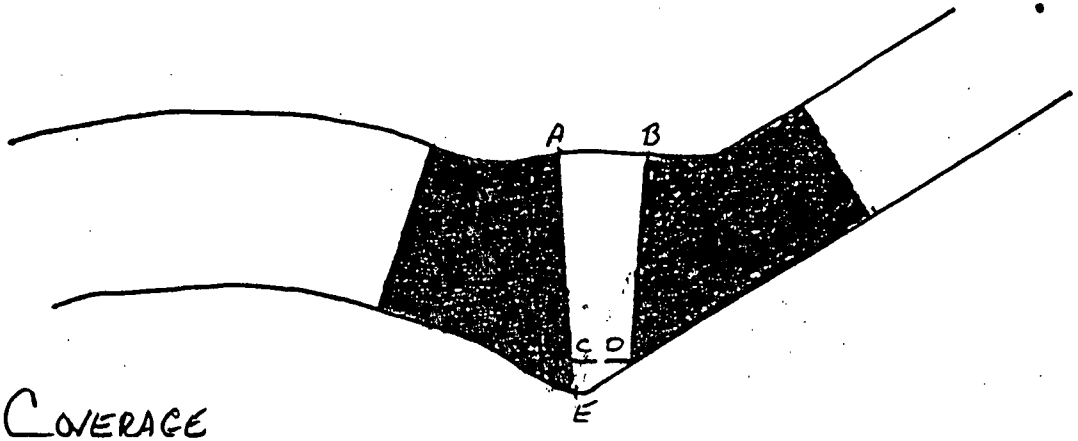
Sketch or Photo:

Comments: CIRC. SCAN:

AREA of COVERAGE: $ABCD = \frac{1.1}{2}(.45" + .3") = .4125^2$ IN.

$CDE = \frac{.3" \times .15"}{2} = .0225^2$ IN.

$.435^2$ IN. = $.44^2$ IN.



$.44^2$ IN. COVERAGE

NOTE: 45° & 60° CIRC. SCANS COVER IDENTICAL AREAS.

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

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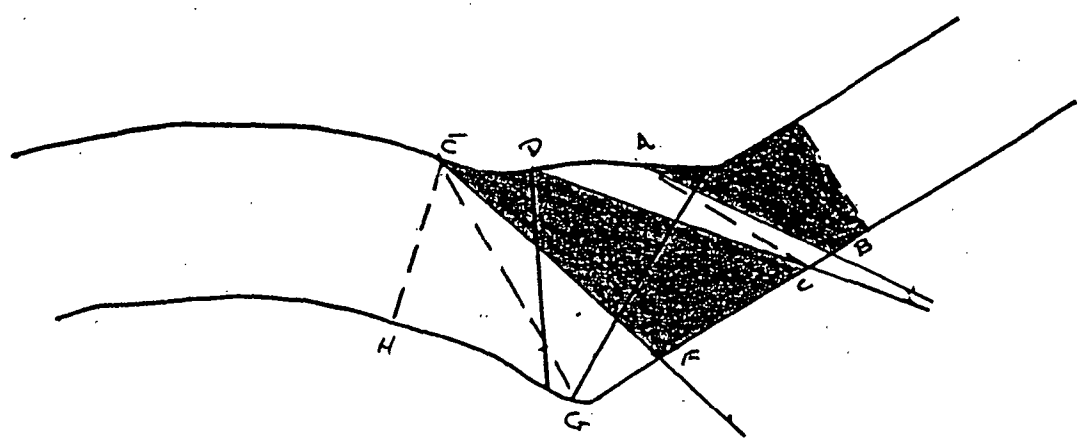
Summary No.: B03.150.002

Sketch or Photo:

Comments: 2-LDCA-OUT -V2

CIRC. CONTOUR



AREA OF COVERAGE

ABC: $\frac{1.0in \times .1in}{2} = .05in^2$

ACD: $\frac{1.0in \times .55in}{2} = .275in^2$

EFG: $\frac{1.4in \times .5in}{2} = .35in^2$

EGH: $\frac{1.0in \times .875in}{2} = .4375in^2$

TOTAL AREA: $1.111in^2$

60° AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

SCALE: FULL

Duke Energy

Supplemental Report

Report No.: UT-05-323

Page: 15 of 16

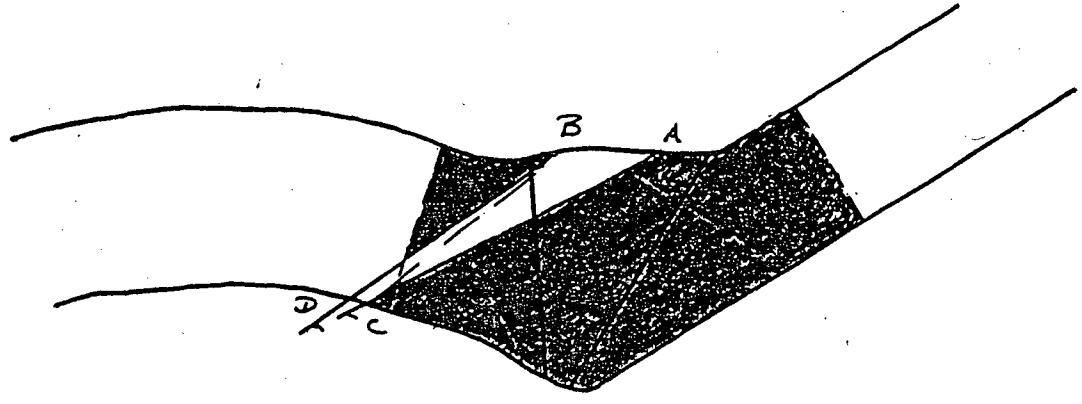
Summary No.: B03.150.002

Sketch or Photo:

Comments: 2-LDCA-OUT -V2

CIRC. CONTOUR

AREA OF COVERAGE



ABC: $\frac{1.25in \times .25in}{2} = .156in^2$

BCD: $\frac{.1in \times 1.25in}{2} = .063in^2$

TOTAL AREA = $.219in^2$

60° AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

SCALE: FULL

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2-LDCA-OUT-V2 **Item No:** B03.150.002

remarks: Due to branch connection configuration.

[X] NO SCAN SURFACE BEAM DIRECTION
[ ] LIMITED SCAN [ ] 1 [X] 2 [X] 1 [ ] 2 [X] cw [X] ccw
FROM L N/A to L N/A INCHES FROM W0 .5" to Beyond
ANGLE: [ ] 0 [X] 45 [X] 60 other ____ FROM 0 DEG to 360 DEG

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

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

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

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

Prepared By: Larry Mauldin *Larry Mauldin* Level: II Date: 11/01/2005 Sheet 16 of 16

Reviewed By: *David K [illegible] III* Date: 11/03/05 Authorized Inspector: *Nancy C Ritchie Slaughter* Date: 11/6/05

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.011.001	Procedure Rev.:	16	Report No.:	UT-05-344
Workscope:	ISI	Work Order No.:	98705713	Page:	1 of 4

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.11.1 Location: N/A

Drawing No.: 2LP-148 Description: Pipe to Valve (2LP-47)

System ID: 53A

Component ID: C05.011.001 /2LP-148-16 Size/Length: N/A Thickness/Diameter: 1.125 / 10.0

Limitations: Yes- See Attached Limitation Report Start Time: 1010 Finish Time: 1040

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

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

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27221 Surface Temp.: 66 °F

Cal. Report No.: CAL-05-358, CAL-05-359, CAL-05-360

Angle Used	0	45	45T	60	60L	
Scanning dB			50.1	60	57	

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

Comments:

FC 05-08

Results: Accept ☑ Reject ☐ Info ☐ CMB 10/3/07

Percent Of Coverage Obtained > 90%: No - 72.4 % Scan 10-3-07 Reviewed Previous Data: Yes

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Eaton, Jay A.			11/4/2005		Gary Moss		11-7-05
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Steinbauer, Troy			11/4/2005	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A					Nancy C Ritchie Stoughton		11/8/05

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2LP-148-16 **Item No:** C05.011.001 **remarks:**

☒ NO SCAN SURFACE BEAM DIRECTION — Valve Configuration

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

FROM L 0+6.75 to L _____ INCHES FROM **W0** +0.7" to Beyond

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

☐ NO SCAN SURFACE BEAM DIRECTION — Branch Connection

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

FROM L 0+6.75" to L 0+10.25 INCHES FROM **W0** +1.2" to Beyond — (3.5" ÷ 33.8") x 100 = 10.4%

ANGLE: ☐ 0 ☐ 45 ☒ 60 other _____ FROM _____ DEG to _____ DEG — of total weld length

☐ NO SCAN SURFACE BEAM DIRECTION

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

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

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

☐ NO SCAN SURFACE BEAM DIRECTION

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

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

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

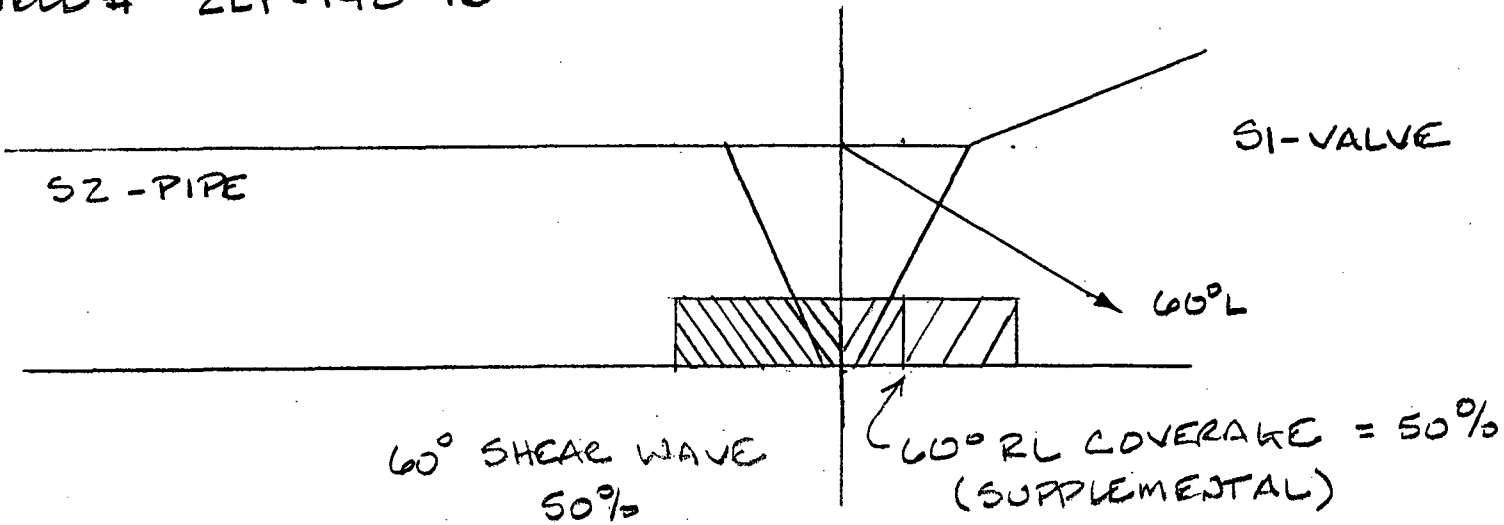
Sketch(s) attached ☒ yes ☐ No

Prepared By: Jay Eaton Level: III Date: 11/04/2005 Sheet 2 of 4

Reviewed By: Gary Moss Date: 11-7-05 Authorized Inspector: Nancy C Ritchie Stoughton Date: 11/8/05

REPORT # UT-05-344
PAGE 3 OF 4

ITEM # C05.011.001
WELD # ZLP-148-16



SCALE 1:1

III 11/4/05

IDDEAL software suite

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: ONS 1 2 | Procedure: NDE-600 | Outage No.: ONS2-27
Summary No.: C05-011.001 | Procedure Rev.: 16 | Report No.: UT-05-344
Workscope: ISI | Work Order No.: 98705713 | Page: 4 of 4

45 deg

Scan 1		% Length X		% volume of length / 100 =		% total for Scan 1
Scan 2		% Length X		% volume of length / 100 =		% total for Scan 2
Scan 3	100	% Length X	80	% volume of length / 100 =	80	% total for Scan 3
Scan 4	100	% Length X	80	% volume of length / 100 =	80	% total for Scan 4

Add totals and divide by # scans = 80 **% 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	% Length X	40	% volume of length / 100 =	40	% total for Scan 1
Scan 2	100	% Length X	0	% volume of length / 100 =	0	% 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:

50 **% Total for complete exam**

Site Field Supervisor: James J. McGuire III Date: 10-3-07

10/3/07

Additional - Calculation Pipe <edit from Setup>

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.026	Procedure Rev.:	16	Report No.:	UT-05-244
Workscope:	ISI	Work Order No.:	98709800	Page:	1 of 4

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.21.26 Location: N/A

Drawing No.: 2-51A-17 (5) Description: Pipe to Valve (2HP-128)

System ID: 51A

Component ID: C05.021.026 /2-51A-17-111 Size/Length: N/A Thickness/Diameter: .531 / 4.0

Limitations: Yes - See Attached Limitation Report Start Time: 1000 Finish Time: 1030

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

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

Temp. Tool Mfg.: D.A.S Serial No.: MCNDE32797 Surface Temp.: 99 °F

Cal. Report No.: CAL-05-254, CAL-05-255, CAL-05-256

Angle Used	0	45	45T	60	60L	
Scanning dB			43.8	40	55.5	

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

Comments:

FC 05-08

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Houser, Gayle E.		GE Houser	8/22/2005	Dan Moss			8/23/05
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Jones, Russel			8/22/2005	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				Nancy C Ritchie Loughlin			8/25/05

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.026	Procedure Rev.:	16	Report No.:	UT-05-244
Workscope:	ISI	Work Order No.:	98709800	Page:	2 of 4

45 deg

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

37.5 **% Total for complete exam**

Site Field Supervisor: **David K. Zimmerman** Date: **8/23/2005**

Note: 60°RL scan not included in percent coverage per requirements of 10CFR50.55a(b)(2)(xx)(A)(2). Best effort scan with 60°RL obtained 50.0% coverage in one axial direction.

Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.026	Procedure Rev.:	16	Report No.:	UT-05-244
Workscope:	ISI	Work Order No.:	98709800	Page:	3 of 4

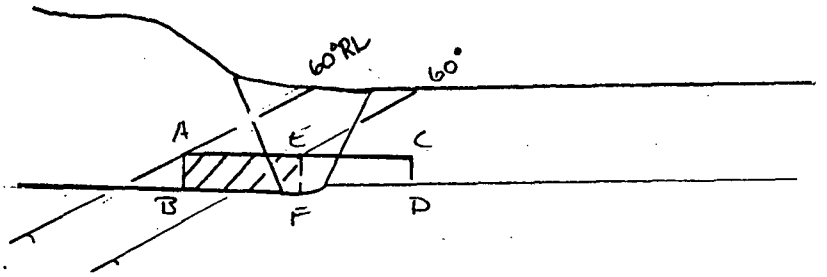
Description of Limitation:

See ISI Limitation Report for details of scanning limitations.

t = 0.54in
AREA OF INTEREST
ABCD: 0.18in x 1.2in = 0.22in²

Sketch of Limitation:

S1 - VALVE 2HP-128



S2 - PIPE

Scan 1 - NO SCAN @ 0%
Scan 2 - EFCD: 0.18in x 0.60in = 0.11in/0.22in x 100 = 50%
Scan 3 - EFCD: 0.18in x 0.60in = 0.11in/0.22in x 100 = 50%
Scan 4 - EFCD: 0.18in x 0.60in = 0.11in/0.22in x 100 = 50%

SUPPLEMENTAL SCAN - 60°RL
Scan 2 - ABEF: 0.18in x 0.60in = 0.11in/0.22in x 100 = 50%

Limitations removal requirements:

Radiation field: SCALE: FULL

Examiner Houser, Gayle E.	Level III	Signature DEHouser	Date 8/22/2005	Reviewer Darrell K. Smith III		Signature	Date 08/22/05
Examiner Jones, Russel	Level II	Signature	Date 8/22/2005	Site Review N/A		Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review Nancy C Ritchel Slaughter		Signature	Date 10/24/05

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2-51A-17-111 **Item No:** C05.021.026 **remarks:**

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

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

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

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

Sketch(s) attached
☒ yes ☐ No

Prepared By: Gayle Houser NE Houser Level: III Date: 08/22/2005 Sheet 4 of 4

Reviewed By: [signature] Date: 08/23/05

Authorized Inspector: Nancy C Ritchie Loughlin Date: 8/25/05

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.027	Procedure Rev.:	16	Report No.:	UT-05-241
Workscope:	ISI	Work Order No.:	98709809	Page:	1 of 4

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.21.27 Location: N/A

Drawing No.: 2HP-227 Description: Pipe to Valve (Valve 2HP-117)

System ID: 51A

Component ID: C05.021.027 /2HP-227-3 Size/Length: N/A Thickness/Diameter: .531 / 4.0

Limitations: Yes- See Attached Limitation Report Start Time: 1012 Finish Time: 1029

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

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

Temp. Tool Mfg.: D.A.S Serial No.: MCNDE32797 Surface Temp.: 99 °F

Cal. Report No.: CAL-05-251, CAL-05-252, CAL-05-253

Angle Used	0	45	45T	60	60L	
Scanning dB			42.5	44.5	59.5	

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

Comments:

FC 05-08

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Leeper, Winfred C.		Winfred C. Leeper	8/22/2005			Gary Mon	8-24-05
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Tucker, David K.		David Tucker	8/22/2005	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Nancy C Ritchie Sloughter	8/25/05

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

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Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.027	Procedure Rev.:	16	Report No.:	UT-05-241
Workscope:	ISI	Work Order No.:	98709809	Page:	2 of 4

45 deg

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

37.5 **% Total for complete exam**

Site Field Supervisor: **David K. Zimmerman** Date: 8/23/2005

Note: 60°RL scan not included in percent coverage per requirements of 10CFR50.55a(b)(2)(xx)(A)(2). Best effort scan with 60°RL obtained 50.0% coverage in one axial direction.

Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.027	Procedure Rev.:	16	Report No.:	UT-05-241
Workscope:	ISI	Work Order No.:	98709809	Page:	3 of 4

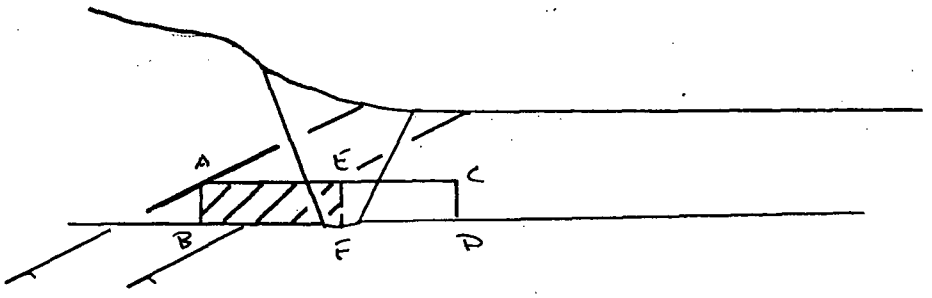
Description of Limitation:

See ISI Limitation Report for details of scan limitations.

t = 0.615in
AREA OF INTEREST
ABCD: 0.205in x 1.3in = 0.266in²

Sketch of Limitation:

S1 - VALVE 117



S2 - PIPE

SCAN 1 - NO SCAN @ 0%
SCAN 2 - EFCD: 0.205in x 0.65in = 0.133in²/0.266in² x 100 = 50%
SCAN 3 - EFCD: 0.205in x 0.65in = 0.133in²/0.266in² x 100 = 50%
SCAN 4 - EFCD: 0.205in x 0.65in = 0.133in²/0.266in² x 100 = 50%

SUPPLEMENTAL SCAN - 60°RL
SCAN 2 - ABEF: 0.205in x 0.65in = 0.133in²/0.266in² x 100 = 50%

Limitations removal requirements:

SCALE: FULL

Radiation field:

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Leeper, Winfred C.		Winfred C. Leeper	8/22/2005	Daniel K. Tucker			08/22/05
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Tucker, David K.		David K. Tucker	8/22/2005	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				Nancy C. Rotetle Slaughter			10/24/05

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2HP-227-3 **Item No:** C05.021.027 **remarks:**

☒ NO SCAN SURFACE BEAM DIRECTION — Valve 2HP-117 Configuration
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A INCHES FROM W0 CL to Beyond
ANGLE: ☐ 0 ☐ 45 ☒ 60 other ____ FROM 0 DEG to 360 DEG

☐ NO SCAN SURFACE BEAM DIRECTION — Valve 2HP-117 Configuration
☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☐ 2 ☒ cw ☒ ccw
FROM L N/A to L N/A INCHES FROM W0 C/L to Beyond
ANGLE: ☐ 0 ☒ 45 ☐ 60 other ____ FROM 0 DEG to 360 DEG

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

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

Sketch(s) attached ☒ yes ☐ No

Prepared By: Winfred Leeper Level: II Date: 08/22/2005 Sheet 4 of 4

Reviewed By: David Zimmerman Date: 08/22/05 Authorized Inspector: Nancy C Ritchie Houghton Date: 8/25/05

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UT Pipe Weld Examination

Site/Unit: Oconee / 2 | Procedure: NDE-600 | Outage No.: ONS2-21

Summary No.: C05.021.028 | Procedure Rev.: 16 | Report No.: UT-05-240

Workscope: ISI | Work Order No.: 98709809 | Page: 1 of 4

Code: 1998 thru 2000 Addenda | Cat./Item: C-F-1/C5.21.28 | Location: N/A

Drawing No.: 2HP-227 | Description: Pipe to Valve (Valve 2HP-148)

System ID: 51A

Component ID: C05.021.028 /2HP-227-7 | Size/Length: N/A | Thickness/Diameter: .531 / 4.0

Limitations: Yes-See Attached Limitation Report | Start Time: 1009 | Finish Time: 1026

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

Lo Location: 9.1.1.5 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 03125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32797 | Surface Temp.: 99 °F

Cal. Report No.: CAL-05-251, CAL-05-252, CAL-05-253

Angle Used	0	45	45T	60	60L	
Scanning dB			42.5	44.5	59.5	

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

Comments:

FC 05-08

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner Level II Leeper, Winfred C.	Signature Winfred C. Leeper	Date 8/22/2005	Reviewer Dan Moss	Signature	Date 8/24/05
Examiner Level II-N Tucker, David K.	Signature David K. Tucker	Date 8/22/2005	Site Review N/A	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review	Signature Nancy C. Ritchie Sloughter	Date 8/25/05

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.028	Procedure Rev.:	16	Report No.:	UT-05-240
Workscope:	ISI	Work Order No.:	98709809	Page:	2 of 4

45 deg

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

37.5 **% Total for complete exam**

Site Field Supervisor: **David K.Zimmerman** Date: **8/23/2005**

Note: 60°RL scan not included in percent coverage per requirements of 10CFR50.55a(b)(2)(xx)(A)(2). Best effort scan with 60°RL obtained 50.0% coverage in one axial direction.

Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.028	Procedure Rev.:	16	Report No.:	UT-05-240
Workscope:	ISI	Work Order No.:	98709809	Page:	3 of 4

Description of Limitation:

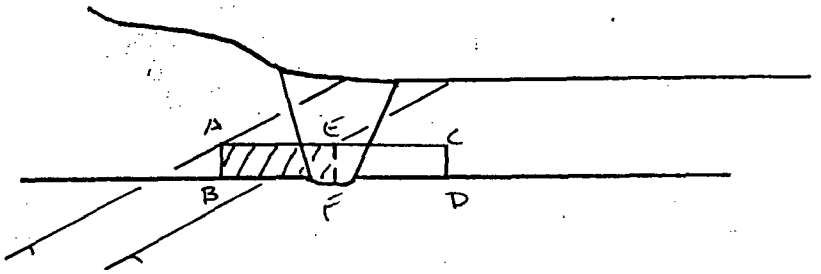
See ISI Limitation Report for details of scan limitations.

$t = 0.525in$

AREA OF INTEREST

ABCD: $0.175in \times 1.2in = 0.21in^2$

Sketch of Limitation:



S1 - VALVE 148

S2 - PIPE

SCAN 1 - NO SCAN ∴ 0%

SCAN 2 - EFCD: $0.175in \times 0.60in = 0.105in^2 / 0.21in^2 (100) = 50\%$

SCAN 3 - EFCD: $0.175in \times 0.60in = 0.105in^2 / 0.21in^2 (100) = 50\%$

SCAN 4 - EFCD: $0.175in \times 0.60in = 0.105in^2 / 0.21in^2 (100) = 50\%$

SUPPLEMENTAL SCAN - 60°RL

SCAN 2 - ABEF: $0.175in \times 0.60in = 0.105in^2 / 0.21in^2 (100) = 50\%$

Limitations removal requirements:

SCALE: FULL

Radiation field:

Examiner Leeper, Winfred C.	Level II	Signature Winfred C. Leeper	Date 8/22/2005	Reviewer Daniel K. Smith III		Signature	Date 08/22/05
Examiner Tucker, David K.	Level II-N	Signature David K. Tucker	Date 8/22/2005	Site Review N/A		Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review Nancy C. Ritchie Slaughter		Signature	Date 10/24/05

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DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2HP-227-7 **Item No:** C05.021.028 **remarks:**

☒ NO SCAN SURFACE BEAM DIRECTION — Valve 2HP-148 Configuration
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A INCHES FROM W0 CL to Beyond
ANGLE: ☐ 0 ☐ 45 ☒ 60 other ____ FROM 0 DEG to 360 DEG

☐ NO SCAN SURFACE BEAM DIRECTION — Valve 2HP-148 Configuration
☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☐ 2 ☒ cw ☒ ccw
FROM L N/A to L N/A INCHES FROM W0 C/L to Beyond
ANGLE: ☐ 0 ☒ 45 ☐ 60 other ____ FROM 0 DEG to 360 DEG

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

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

Sketch(s) attached ☒ yes ☐ No

Prepared By: Winfred Leeper Level: II Date: 08/22/2005 Sheet 4 of 4

Reviewed By: David Zimmerman Level: III Date: 08/22/05 Authorized Inspector: Nancy C Ritchie Slaughter Date: 8/25/05

UT Pipe Examination

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Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.073	Procedure Rev.:	16	Report No.:	UT-05-234
Workscope:	ISI	Work Order No.:	98709812	Page:	1 of 4

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.21.73 Location: N/A

Drawing No.: 2-51A-28 (3) Description: Tee to Pipe

System ID: 51A

Component ID: C05.021.073 /2-51A-28-67 Size/Length: N/A Thickness/Diameter: .375 / 2.50

Limitations: Yes-See Attached Limitation Report Start Time: 0949 Finish Time: 1008

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

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

Temp. Tool Mfg.: D.A.S Serial No.: MCNDE32798 Surface Temp.: 101.5 °F

Cal. Report No.: CAL-05-242, CAL-05-243, CAL-05-244

Angle Used	0	45	45T	60	70	
Scanning dB			38	39.2	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 - 79.2% Reviewed Previous Data: Yes

Examiner	Level III	Signature	Date	Reviewed		Signature	Date
Houser, Gayle E.			8/16/2005				8-17-05
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Jones, Russel			8/16/2005	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Nancy C Ritchel Stoughton	8/18/05

Duke Energy.

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.073	Procedure Rev.:	16	Report No.:	UT-05-234
Workscope:	ISI	Work Order No.:	98709812	Page:	2 of 4

45 deg

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

Add totals and divide by # scans = 100.000 % 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	72.200	% volume of length / 100 =	72.200	% total for Scan 1
Scan 2	100.000	% Length X	44.400	% volume of length / 100 =	44.400	% 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;

79.150 % Total for complete exam

Site Field Supervisor: **David K. Zimmerman** David K. Zimmerman III Date: **8/16/2005**

Note: 70° shear scan not included in percent coverage per requirements of 10CFR50.55a(b)(2)(xx)(A)(2). Best effort scan with 70°shear obtained 55.6% coverage in one axial direction.

51 & 52

Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2-21
Summary No.:	C05.021.073	Procedure Rev.:	16	Report No.:	UT-05-234
Workscope:	ISI	Work Order No.:	98709812	Page:	3 of 4

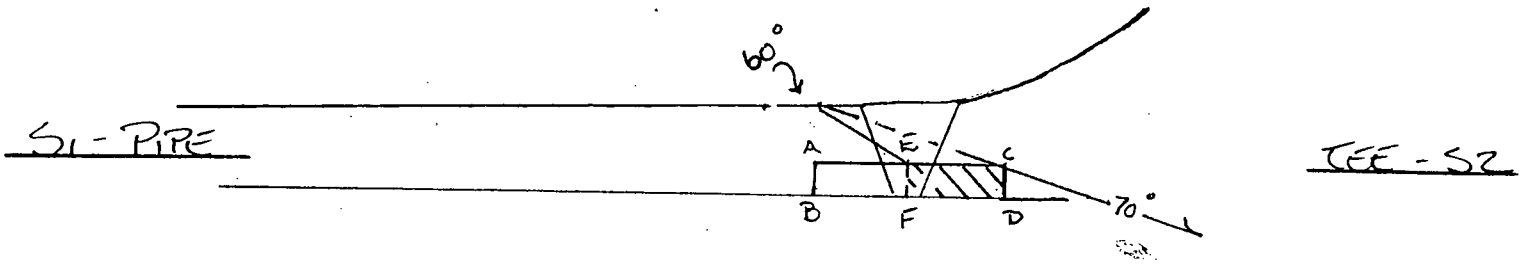
Description of Limitation:

See ISI LIMITATION REPORT for limited details.

$t = 0.45in$

$l = 9.0in$ (weld length)

Sketch of Limitation:



TOTAL AREA - ABCD: $1.0in \times 0.15in = 0.15in^2$

AREA - EFCD: $0.5in \times 0.15in = 0.075in^2$

TOTAL VOLUME

$0.15in^2 \times 9.0in = 1.35in^2$

SCAN 1: $(1.0in \times 0.15in)(4.0in) + (0.5in \times 0.15in)(5.0in) = 0.975in^3 / 1.35in^3 (100) = 72.2$

SCAN 2: $(1.0in \times 0.15in)(4.0in) = 0.6in^2 / 1.35in (100) = 44.4\%$

SCAN 3: 100% - No Loss

SCAN 4: 100% - No Loss

SUPPLEMENTAL SCAN (70°): $(1.0in \times 0.15in)(5.0in) = 0.75in^3 / 1.35in^3 (100) = 55.6\%$

Limitations removal requirements:

FULL COVERAGE ☐

PARTIAL COVERAGE ▨

Radiation field:

SCALE: FULL

Examiner	Level III	Signature	Date	Reviewer	Signature	Date
Houser, Gayle E.			8/16/2005			08/16/05
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Jones, Russel			8/16/2005	N/A		
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Nancy C Ritchie	Slaughter	8/18/05

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2-51A-28-67 **Item No:** C05.021.073 **remarks:**

☐ NO SCAN SURFACE BEAM DIRECTION — Tee Configuration

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

FROM L 7.75 to L 1.25 INCHES FROM W0 _____ to _____

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

☐ NO SCAN SURFACE BEAM DIRECTION — Tee Configuration

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

FROM L 3.25 to L 5.75 INCHES FROM W0 _____ to _____

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

☐ NO SCAN SURFACE BEAM DIRECTION

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

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

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

☐ NO SCAN SURFACE BEAM DIRECTION

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

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

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

Sketch(s) attached ☐ yes ☐ No

Prepared By: David Zimmerman Level: III Date: 08/16/2005 Sheet 4 of 4

Reviewed By: Date: 8-17-05

Authorized Inspector: Date: 8/18/05