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February 13, 2008

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

Subject: Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke)
Oconee Nuclear Station, Unit 2
Docket Nos. 50-270
Third Ten Year Inservice Inspection Interval
Request for Relief No. 04-ON-009, Revision 1

By letter dated September 13, 2004, Duke submitted Request for Relief 04-ON-009 seeking relief pursuant to 10 CFR 50.55a(g)(5)(iii), from the requirement to examine 100% of the volume specified by the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda (as modified by Code Case N-460).

Subsequently, Duke recognized that a portion of the justification for the relief contained inaccurate wording relative to a method of detecting a leak should it develop at one of the subject welds. Duke communicated to the NRC an intent to submit a revised version of the relief to correct that issue.

Duke notes that this request applies to the third Inservice Inspection Interval for Oconee Unit 2, which terminated September 9, 2004. At this time, Duke is submitting the attached request, which is considered Revision 1 and replaces and supersedes the original request in its entirety. Duke requests NRC review and approval in order to close out the third interval documentation.

The relief would allow Duke Energy to take credit for ten (10) limited ultrasonic examinations on welds associated with various systems and components described in the request.

During examination of the subject Unit 2 welds, the ultrasonic examination coverage did not meet the 90% examination requirements of Code Case N-460. The obtainable volume coverage for each weld examination is indicated on the attached request. Achievement of greater examination coverage for these welds was impractical due to piping/valve geometry, interferences, and existing

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examination technology. 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

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Relief Request 04-ON-009

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

Inservice Inspection Impracticality

Duke Energy Carolinas

Oconee Nuclear Station – Unit 2 (EOC-20)

Third 10-Year Interval – Inservice Inspection Plan

Interval Start Date= 12-16-1994 Interval End Date=9-9-2004

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

The ID's and Item Numbers for the ten welds are as follows:

List Number	Weld ID	Item Number
1.	2-LDCB-INLET-V1	B03.150.003
2.	2-LDCB-OUTLET-V2	B03.150.004
3.	2HP-215-3	B09.011.017
4.	2-51A-17-124	C05.021.021
5.	2-51A-17-92	C05.021.022
6.	2-51A-17-125	C05.021.023
7.	2-51A-17-20A	C05.021.051
8.	2-51A-17-102	C05.021.054
9.	2HP-227-11	C05.021.056
10.	2-51A-31-50	C05.021.058

Attachment A contains a drawing for item numbers B03.150.003 and B03.150.004

Attachment B contains the inspection data for the 10 welds

Note: Items in this relief request were inspected during one of the following months: February, March, or April of 2004.

I. ASME Code Component Affected

Letdown Cooler 2B
High Pressure Injection System
Inlet Nozzle to Channel Head Weld
Weld ID = 2-LDCB-INLET-V1
Item Number/Summary Number = B03.150.003

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.150
Fig. IWB-2500-7 (a), 100% Volume Coverage of Examination Volume A-B-C-D-E-F-G-H-I-J

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% coverage of the required examination volume was obtained for this weld. The percentage of coverage reported represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° scan perpendicular and parallel to the weld covered 28%; 60° scan perpendicular and parallel to the weld covered, 29%. 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 order to scan all of the required surfaces for the inspection of these welds, 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-B-C-D-E-F-G-H-I-J; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for item number B03.150 were conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII of the 1995 Edition with the 1996 Addenda. The ultrasonic procedures used complied with the requirements of ASME Section V, Article 4, 1989 Edition with no addenda.

Duke will use Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to compliment the limited scan examinations. The Code requires that a pressure test be performed after each refueling outage for Class 1. These tests require a VT-2 visual examination for evidence of leakage. This testing provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component.

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 the pressure testing (VT-2) examinations 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

Letdown Cooler 2B
High Pressure Injection System
Outlet Nozzle to Channel Head Weld
Weld ID = 2-LDCB-OUTLET-V2
Item Number/Summary Number = B03.150.004

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.150
Fig. IWB-2500-7 (a), 100% Volume Coverage of Examination Volume A-B-C-D-E-F-G-H-I-J

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 % 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. The coverage from each scan was as follows: 45° scan perpendicular and parallel to the weld covered 28%; 60° scan perpendicular and parallel to the weld covered 29%. 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 order to scan all of the required surfaces for the inspection of these welds, 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume A-B-C-D-E-F-G-H-I-J; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for item number B03.150 were conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII of the 1995 Edition with the 1996 Addenda. The ultrasonic procedures used complied with the requirements of ASME Section V, Article 4, 1989 Edition with no addenda.

Duke will use Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to compliment the limited scan examinations. The Code requires that a pressure test be performed after each refueling outage for Class 1. These tests require a VT-2 visual examination for evidence of leakage. This testing provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component.

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 the pressure testing (VT-2) examinations 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

Class 1 Piping Weld
High Pressure Injection System
Tee to Reducer Weld
Weld ID = 2HP-215-3
Item Number/Summary Number = B09.011.017

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

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

IV. Impracticality of Compliance

The tee and reducer material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of .531 inches.

During the ultrasonic examination of this weld, 88% 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 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the examination volume and the 60° shear wave axial scan covered 77.7% from two directions. A supplemental 60° refracted longitudinal wave scan covered 100% of the examination volume in one axial direction from the reducer side. The limitation was 4 inches long on the tee side of the weld caused by the throat of the tee. In order to scan all of the required surfaces for the inspection of this weld, the tee would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of area/weld for item number B09.011 was conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the Performance Demonstration Initiative (PDI). In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on the B09.011 item and achieved 100% coverage. The result of the surface examination was acceptable.

Duke does not claim credit for coverage of the far side of austenitic welds when access is limited to one side only. 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 sound 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.

The procedures, personnel and equipment have been qualified through the PDI. However, although 60° longitudinal wave search units and 70° shear wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examination of similar metal austenitic piping welds.

Duke will use Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to compliment the limited scan examinations. The Code requires that a pressure test be performed after each refueling outage for Class 1. These tests require a VT-2 visual examination for evidence of leakage. This testing provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component.

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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Pipe to Valve 2HP-118 Weld
Weld ID = 2-51A-17-124
Item Number = C05.021.021

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 pipe material is SA-376/TP304 or TP316 stainless steel and the valve material is A182/F316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of .531 inches.

During the ultrasonic examination of this weld, 34.5% 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 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50% of the examination volume and the 60° shear wave axial scan covered 38.1%. A supplemental 60° refracted longitudinal wave scan covered 100% of the examination volume in one axial direction from the pipe side. Limitations were 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 surfaces for the inspection of 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was 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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Valve 2HP-115 to Tee Weld
Weld ID = 2-51A-17-92
Item Number = C05.021.022

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 A182/F316 stainless steel and the tee material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of .687 inches.

During the ultrasonic examination of this weld, 37.5% 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 45° shear wave circumferential and tangential scans, both clockwise and counter-clockwise covered 50% of the examination volume and the 60° shear wave axial scan covered 50% of the examination volume from the tee side. A supplemental 60° refracted longitudinal wave scan covered 18.89% of the examination volume in one axial direction from the tee side. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was 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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Valve 2HP-118 to Elbow Weld
Weld ID = 2-51A-17-125
Item Number = C05.021.023

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 A182/F316 stainless steel and the elbow material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of .531 inches.

During the ultrasonic examination of this weld, 34.5% 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 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50% of the examination volume and the 60° shear wave axial scan covered 38.1% of the examination volume from the elbow side. A supplemental 60° refracted longitudinal wave scan covered 100% of the examination volume in one axial direction from the elbow side. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was 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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Pipe to Valve 2LP-56 Weld
Weld ID = 2-51A-17-20A
Item Number = C05.021.051

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 A182/F316 stainless steel and the pipe material is SA-312/TP304 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of .216 inches.

During the ultrasonic examination of this weld, 35.2% 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 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50% of the examination volume and the 60° shear wave axial scan covered 40.6%. A supplemental 70° shear wave scan covered 100% of the examination volume in one axial direction from the pipe side. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was 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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Tee to Pipe Weld
Weld ID = 2-51A-17-102
Item Number = C05.021.054

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 and the pipe material is SA-376/TP304 or TP316 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of .438 inches.

During the ultrasonic examination of this weld, 86.1% 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 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the examination volume and the 60° axial scan covered 72.1%. A supplemental 70° shear wave scan covered 100% of the examination volume in one axial direction from the pipe side. The limitation was 4 inches long on the tee side of the weld caused by the throat of the tee. In order to scan all of the required surfaces for the inspection of this weld, the tee would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was 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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Elbow to Valve 2HP-114
Weld ID = 2HP-227-11
Item Number = C05.021.056

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 A182/F316 stainless steel and the elbow material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of .438 inches.

During the ultrasonic examination of this weld, 35.7% 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 45° circumferential scans, both clockwise and counter-clockwise covered 50% of the examination volume and the 60 scan covered 42.9%. A supplemental 70° shear wave scan covered 100% of the examination volume in one axial direction from the elbow side. The limitation was caused by the taper on the valve side of the weld which prevented scanning on that side. In order to scan all of the required surfaces for the inspection of 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

The weld/component was 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, surface and the pressure testing (VT-2) examinations 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

Class 2 Piping Weld
High Pressure Injection System
Pipe to Valve 2HP-20
Weld ID = 2-51A-31-50
Item Number = C05.021.058

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition with no Addenda

III. Applicable Code Requirement

IWC-2500, 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 SA479/TP316 stainless steel and the pipe material is SA-376/TP304 stainless steel.. This weld has a diameter of 3.0 inches and a wall thickness of .438 inches.

During the ultrasonic examination of this weld, 59% 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 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50% of the examination volume and the 60° shear wave axial scan covered 36%. A supplemental 70° shear wave scan covered 100% of the examination volume in one axial direction from the pipe side. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of 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.

The Oconee Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage of examination volume C-D-E-F; therefore, the available coverage will not meet the acceptance criteria of this Code Case.

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

No additional examinations were planned for the areas/welds during the third inspection interval. This request is for the duration of the third inservice inspection interval, which ended on September 9, 2004.

VII. Justification for Granting Relief

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. In addition to the volumetric examinations with limited coverage, Duke performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

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 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and 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 provides adequate 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, system leak rate limitations imposed by Technical Specifications 3.4.13, "Reactor Coolant System Leakage," as well as reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component.

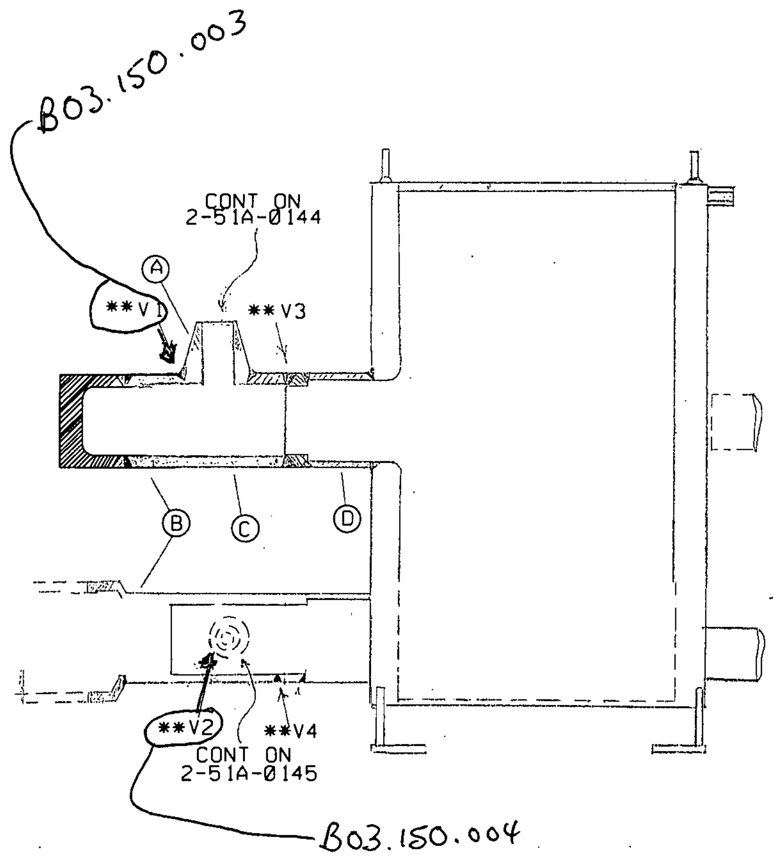
The weld/component was rigorously inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects. Based on the coverage and results of the required volumetric, surface and the pressure testing (VT-2) examinations during this outage, it is Duke's position that this combination of examinations provides a reasonable assurance of quality and safety.

Attachment "A"

BILL OF MATERIAL

MAT'L I.D.	QUANTITY	MATERIAL CLASS	MATERIAL TYPE	SPECIFICATION ASME OR ASTM	SPECIFICATION GRADE	DESCRIPTION	CONST.	SIZE	SCH.	LOT NO.
(A)	O	B	SS	SA182	T316L	BAR	FOR	—	—	
(B)	O	B	SS	SA240	T316L	PLATE	—	—	—	
(C)	O	B	SS	SA182	T316L	BAR	FOR	—	—	
(D)	O	B	CS	SA106	B	PIPE	SMLS	8"	40	
(E)										
(F)										
(G)										
(H)										

ERN: 0X0032RN



* SEE NOTE 8 Δ See Note 9 ** See Note 5

ISO NOT FOR CONSTRUCTION, SEE DESIGN DRAWING

NOTES:

1. ALL WELD NUMBERS SHALL BE PRECEDED BY N/A.
2. LAST WELD NO. 7.
3. REF. LAYOUT DWG. OM 201.2733.001 OM 201.3107.001
4. REF. FLOW DWG. OFD 101A-2.1
5. VENDOR WELDS - WELD Number 5 Not NEEDED
6. WORK REQUEST NO.
7. DESIGN TEMP: 600° DESIGN PRESS: 2500 PSIG
8. Cooler Constructed PER ASME SECT III CLASS 3
9. This ISO will be renamed. The Drawing number will be the cooler serial number. This ISO was originally 2HP-158. This

Cooler is currently Let-Down Cooler 2B. Please file in unit 1 Sys 51A. (All 7 coolers are Designated as unit 1).

NO.	REVISION	DRAWN / DATE	CHK'D / DATE	Mech / DATE
6	DELETE ITEMS E AND F (CHEMICAL CONNECTORS) FROM BILL OF MAT'L AND BODY OF ISO PER REV 4 CHEMICAL CONNECTORS ARE NOT INSTALLED ON THIS COOLER	TSC 12/20/05	HLV 12/21/05	
5	RENUMBER WELDS 2-4. THEY ARE VENDOR WELDS AND WILL BE IDENTIFIED PER THE OM DRAWING FOR THE ISI PROGRAM. RENAME ISO. SEE NOTE 9. ADD CONTINUATIONS	TSC 6-9-93	DEF 6-9-93	TEC 6-9-93
4	DEL. WELDS 6 & 7 & WR# 52367I INCORRECTLY ADDED: ITEMS E & F NOT USED	TSC 8-24-91	DCL 8-24-91	[illegible] 8-27-91
3	Revise Configuration WR 052367I	TSC 7-13-89	SPB 7-18-89	HLV 7-18-89
2	Del. CONT. ADD NOTE 9 WR 052367I	TSC 6-26-89	SPB 6-27-89	HLV 6-27-89
1	ADD WELDS 6 & 7 DEL 1 WR 052367I	TSC 5-31-89	HLV [illegible]	TLF [illegible]
0	REL. FOR ISI	TSC 5-7-89	DCL 5-9-89	HLV 5-12-89

QA CONDITION → ☒ 1 ☐ 2 ☐ 3 ☐ 4

DUKE POWER COMPANY
OCONEE NUCLEAR STATION UNIT

TITLE
LETDOWN COOLER SERIAL NUMBER 34097-2

SYS. 51A LINE NO. 4 DUKE CLASS B*

CODE CLASS III, B31.7 XI CLASS A

PIPING SPEC. 1501.2

LOCATION REACTOR BLD. HPI 758'-0"

DWG. NO. 1-34097-2 Δ REV. NO. 6

REQUEST RELIEF 04-ON-009

ATTACHMENT B

Total Number of Pages = 75

Page Numbers	Weld ID	Item Number
1 thru 16	2-LDCB-INLET-V1	B03.150.0003
17 thru 32	2-LDCB-OUTLET-V2	B03.150.0004
33 thru 37	2HP-215-3	B09.011.017
38 thru 42	2-51A-17-124	C05.021.021
43 thru 49	2-51A-17-92	C05.021.022
50 thru 54	2-51A-17-125	C05.021.023
55 thru 59	2-51A-17-20A	C05.021.051
60 thru 64	2-51A-17-102	C05.021.054
65 thru 69	2HP-227-11	C05.021.056
70 thru 75	2-51A-31-50	C05.021.058

Duke Energy

UT Vessel Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-630	Outage No.:	ONS2EOC20
Summary No.:	B03.150.003	Procedure Rev.:	2	Report No.:	UT-04-152
Workscope:	ISI	Work Order No.:	98603899	Page:	1 of 2

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.150.3 Location: N/A

Drawing No.: 1-34097-2 Description: Nozzle to Channel Body

System ID: 51A

Component ID: B03.150.003 /2-LDCB-INLET-V1 Size/Length: N/A Thickness/Diameter: 0.875"/3.0"

Limitations: Yes- See attached limitation report. Start Time: 0854 Finish Time: 0950

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

Lo Location: 9.2.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 59 °F

Cal. Report No.: CAL-04-242, CAL-04-243, CAL-04-244, CAL-04-245

Angle Used	0	45	45T	60RL	60T	45RL
Scanning dB		40.5	40.5	63.5		66.5

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

Comments:

FC 99-02, 03-17, 03-30

Results: Accept ☑ Reject ☐ Info ☐ Scanning db's less than ref.+14 to abtain 2:1 signal to noise ratio.

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

Examiner Level III Zimmerman, David K.	Signature David K Z	Date 4/5/2004	Reviewer JAM EATON III	Signature JAM	Date 4/9/04
Examiner Level II Mauldin, Larry E.	Signature Larry E Mauldin	Date 4/5/2004	Site Review	Signature	Date
Other Level	Signature	Date	ANII Review Nancy C Ritchie Slaughter	Signature	Date 4/12/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit:	Oconee / 2	Procedure:	NDE-630	Outage No.:	ONS2EOC20
Summary No.:	B03.150.003	Procedure Rev.:	2	Report No.:	UT-04-152
Workscope:	ISI	Work Order No.:	98603899	Page:	2 of 2

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: 4/05/04 4/9/04

DUKE POWER COMPANY
ISI LIMITATION REPORT

Component/Weld ID: 2-LDCB-INLET-V1 **Item No:** B03.150.003

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: 4/05/04	Sheet ~~1~~ 1 of ~~10~~ 14
Reviewed By: *[signature]* III	Date: 4/9/04	Authorized Inspector: *Nancy C Ritchie Slaughter* 4/9/04	Date: 4/12/04

ATTACHMENT TO UT-04-~~137~~ 152

Duke Energy

Supplemental Report

Report No.: UT-04-152
Attachment: ~~Page~~ 2 of 14

Summary No.: 303.150.003
Examiner: David K [signature] Level: III Reviewer: [signature] III Date: 4/9/04
Examiner: Level: Site Review: Date:
Other: Level: ANII Review: Wendy C Ritchie Slaughter Date: 4/12/04

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

Sketch or Photo:

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

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

2-LDCB-INLET-V1

Duke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment: ~~Page:~~ 3 of 14

Summary No.: B03.150.003

Examiner: David K. Z — Level: III — Reviewer: JI — Date: 4/9/04

Examiner: _____ — Level: _____ — Site Review: _____ — Date: _____

Other: _____ — Level: _____ — ANII Review: Nancy C Ritchie Slaughter — Date: 4/12/04

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.

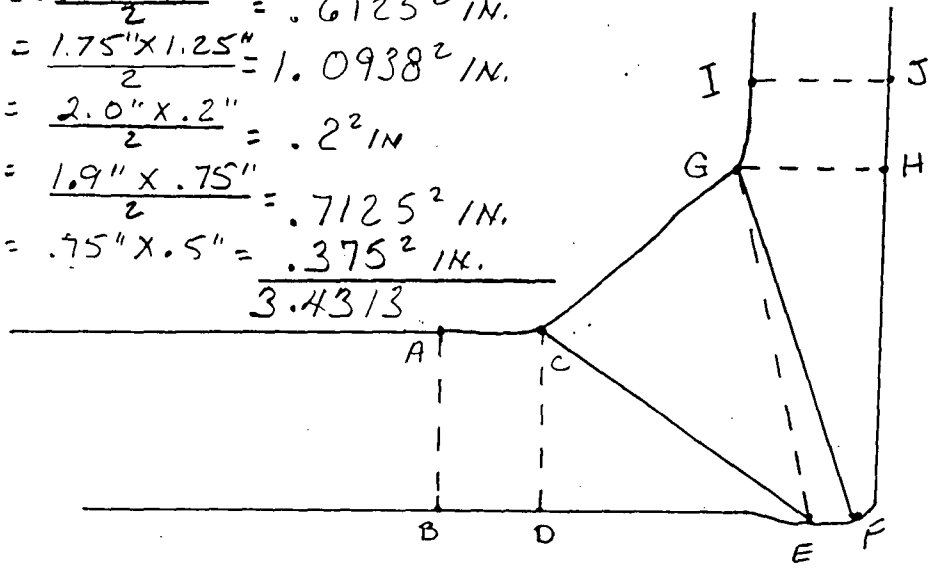
EFG = $\frac{2.0" \times .2"}{2}$ = .2 ^{2} IN

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

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

3.4313

Sketch or Photo:



TOTAL EXAM AREA = 3.43 ^{2} IN.

2-LDCB-INLET-V1

ke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment Page: 4 of 14

Summary No.: B03.150.003

Examiner: David K. Z. Level: III Reviewer: III Date: 4/9/04

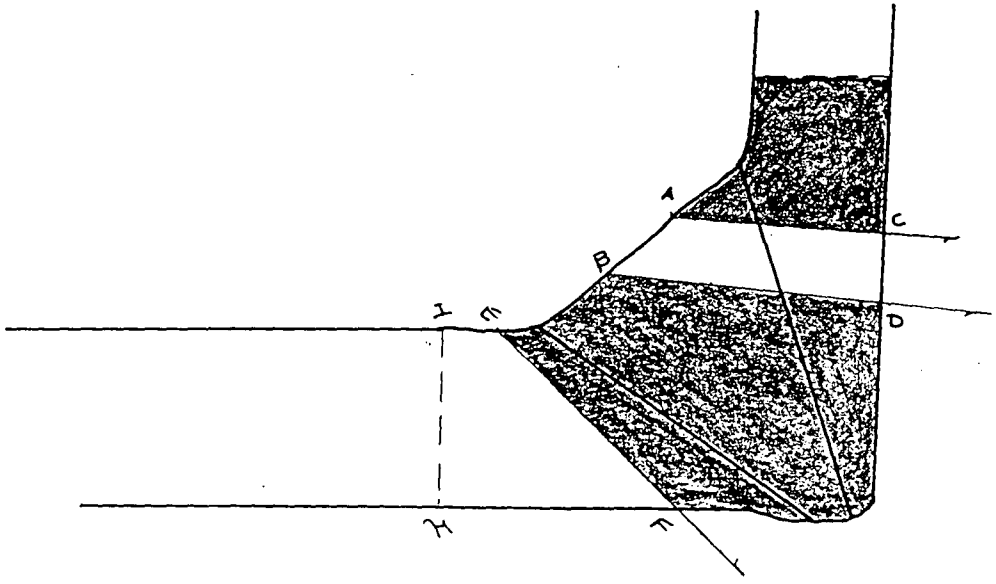
Examiner: Level: Site Review: Date:

Other: Level: ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-INLET-V1

AXIAL CONTOUR

Sketch or Photo:



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

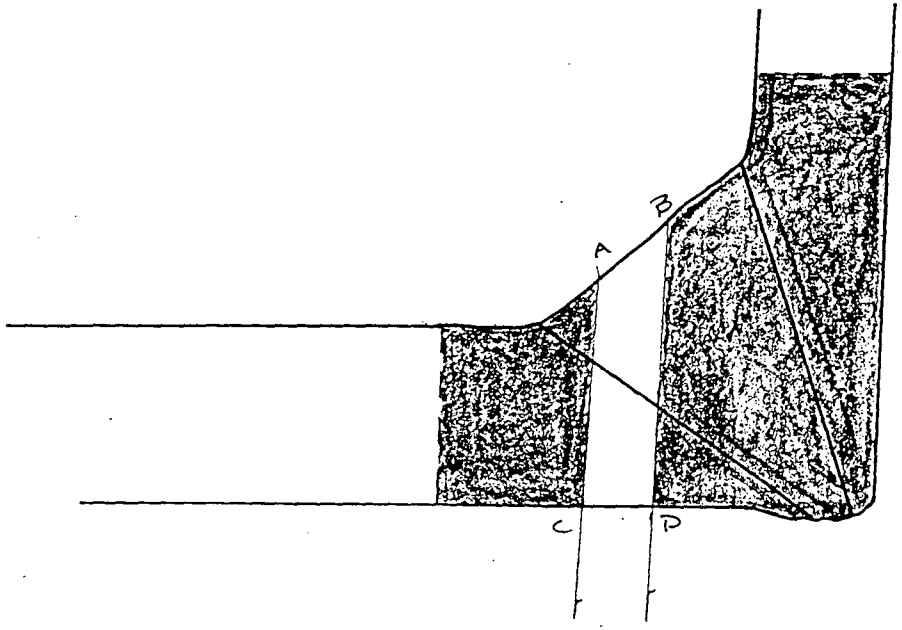
Supplemental Report

Report No.: UT-04-152
Attachment ~~Page~~: 5 of 14

Summary No.: B03.150.003
Examiner: David K. Z. Level: III Reviewer: III Date: 4/9/04
Examiner: Level: Site Review: Date:
Other: Level: ANII Review: Nancy C. Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-INLET-V1

Sketch or Photo:



AXIAL CONTOUR

AREA OF COVERAGE

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

45° AXIAL - SCAN 2

FULL COVERAGE
NO COVERAGE

duke energy.

Supplemental Report

Report No.: UT-04-152

Attachment Page: 6 of 14

Summary No.: B03.150.003

Examiner: David K. [illegible] Level: III Reviewer: [signature] III Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

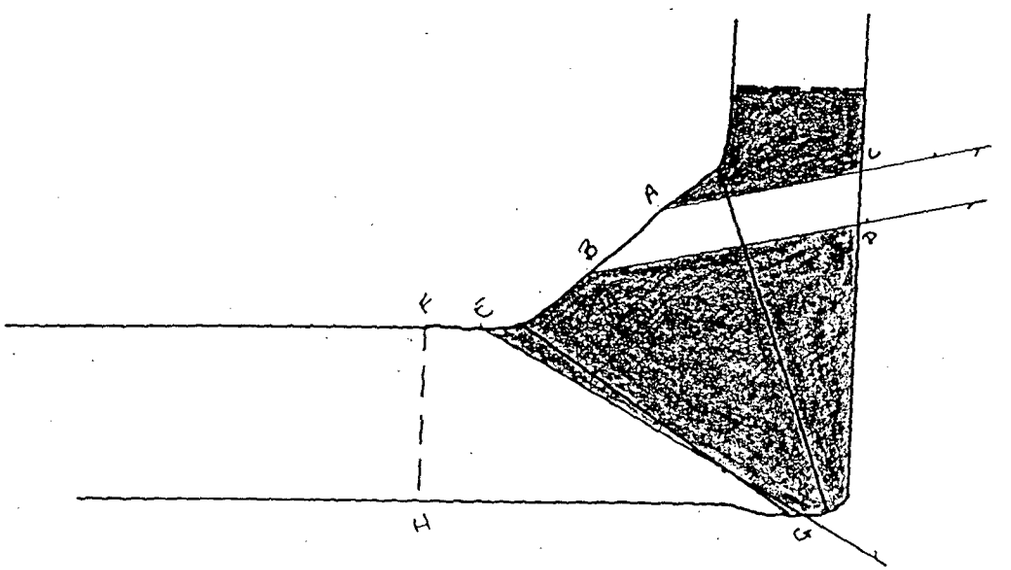
Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-INLET-V1

AXIAL CONTOUR

AREA OF COVERAGE

Sketch or Photo:



ABCD: $\left(\frac{1.45in + 1.1in}{2}\right) 3in = 3.83in^2$

EFGH: $\left(\frac{.35in + .2in}{2}\right) .875in = .1072in^2$

TOTAL AREA = $1.455in^2$

60° AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment Page: 7 of 14

Summary No.: B03.150.003

Examiner: David K. Z — Level: III — Reviewer: [signature] III — Date: 4/9/04

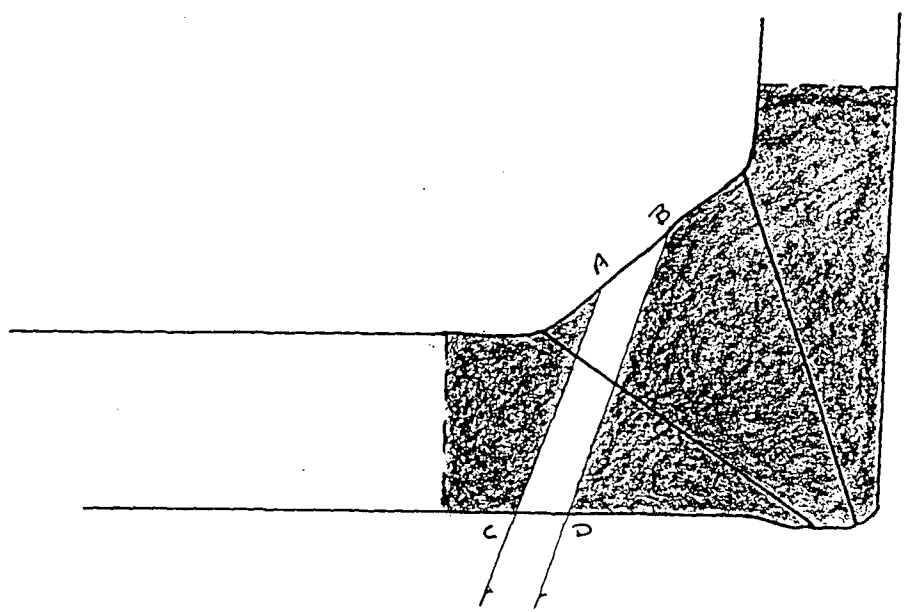
Examiner: _____ — Level: _____ — Site Review: _____ — Date: _____

Other: _____ — Level: _____ — ANII Review: Nancy C Ritchie Slaughter — Date: 7/12/04

Comments: 2-LDCB-INLET-V1

AXIAL CONTOUR

Sketch or Photo:



AREA OF COVERAGE

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

60 AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

Duke Energy.

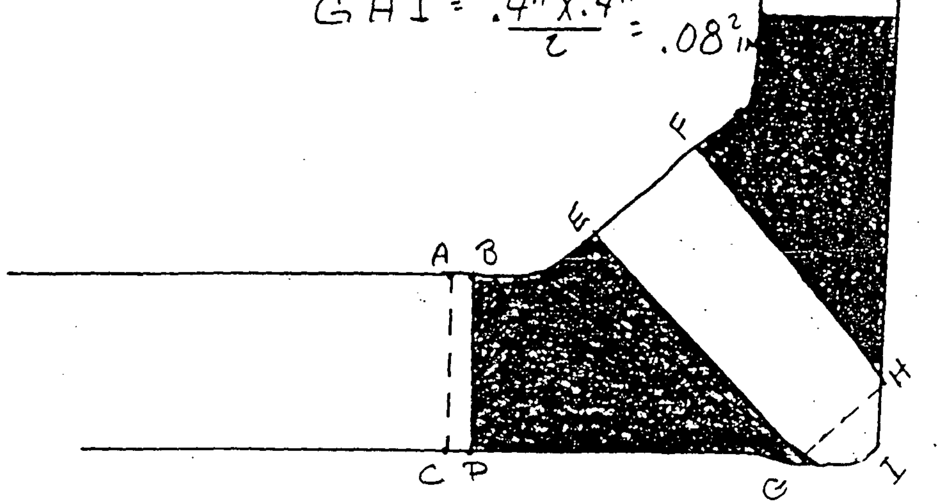
Supplemental Report

Report No.: UT-04-152
Attachment ~~Page:~~ 8 of 14

Summary No.: B03.150.003
Examiner: David K. [signature] Level: III Reviewer: [signature] III Date: 4/5/04
Examiner: Level: Site Review: Date:
Other: Level: ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: CIRC. SCAN:
AREA of COVERAGE:
ABCD = .875" X .1" = .0875 ^{2} IN.
EFGH = 1.6" X .7" = 1.12 ^{2} IN.
GHI = $\frac{.4" X .4"}{2}$ = .08 ^{2} IN.
1.29 ^{2} IN. COVERAGE

Sketch or Photo:



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

2-LDCB-INLET-V1

FULL COVERAGE
NO COVERAGE

Duke Energy

Supplemental Report

Report No.: UT-04-152

Attachment: ~~Page~~ 9 of 14

Summary No.: B03.150.003

Examiner: [signature] Level: III Reviewer: [signature] III Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

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.

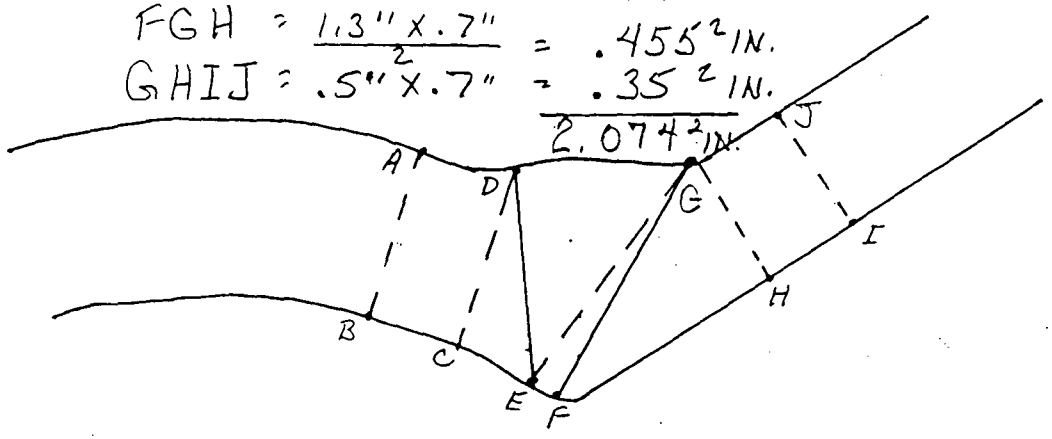
EFG = $\frac{1.4" \times .2"}{2}$ = .14 ^{2} IN.

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

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

2.074 ^{2} IN.

Sketch or Photo:



TOTAL EXAM AREA: 2.07 ^{2} IN.

2 - LDCB - INLET - V1

Duke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment: ~~Page:~~ 10 of 14

Summary No.: B03.150.003

Examiner: David K. B. Level: III Reviewer: JH Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

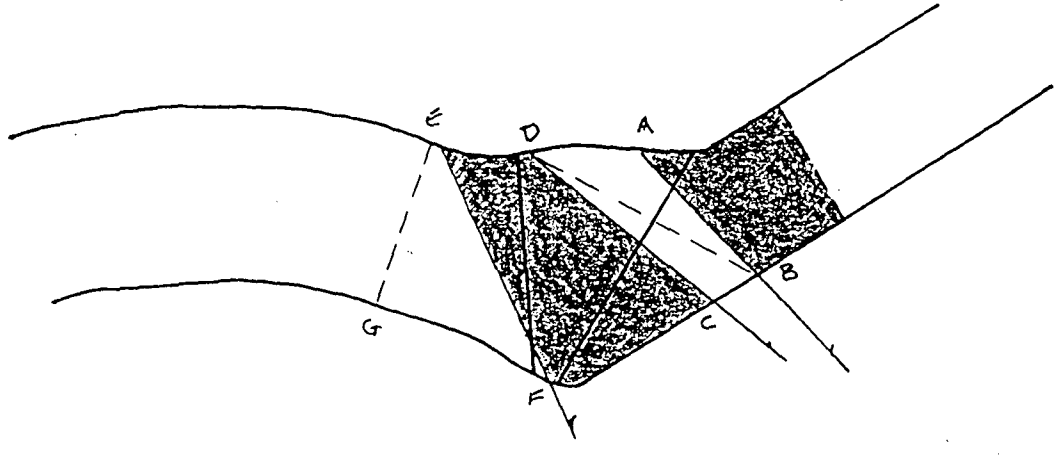
Other: _____ Level: _____ ANII Review: Wonny C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-INLET-V1

CIRC. CONTOUR

Sketch or Photo:

AREA OF COVERAGE



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

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

EGF: $\frac{1.0in \times .815in}{2} = .4360in^2$

TOTAL AREA = $.8560in^2$

45 AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment: ~~Page:~~ 11 of 14

Summary No.: B03.150.003

Examiner: David K Z Level: III Reviewer: JH III Date: 4/9/04

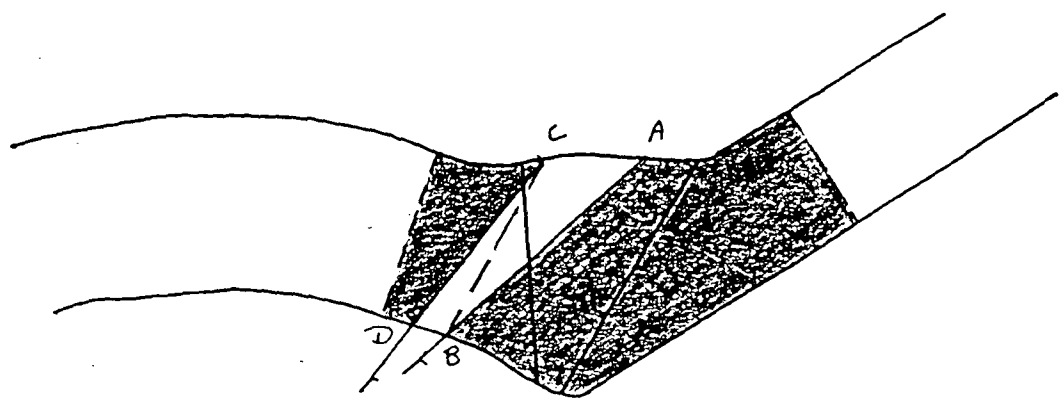
Examiner: _____ Level: _____ Site Review: _____ Date: _____

Other: _____ Level: _____ ANII Review: Nancy C Ritchie Loughlin Date: 4/12/04

Comments: 2-LDCB-INLET-1/1 CIRC CONTOUR

AREA OF COVERAGE

Sketch or Photo:



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

Duke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment: ~~Page:~~ 12 of 14

Summary No.: B03.150.003

Examiner: David K Z Level: III Reviewer: [signature] III Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

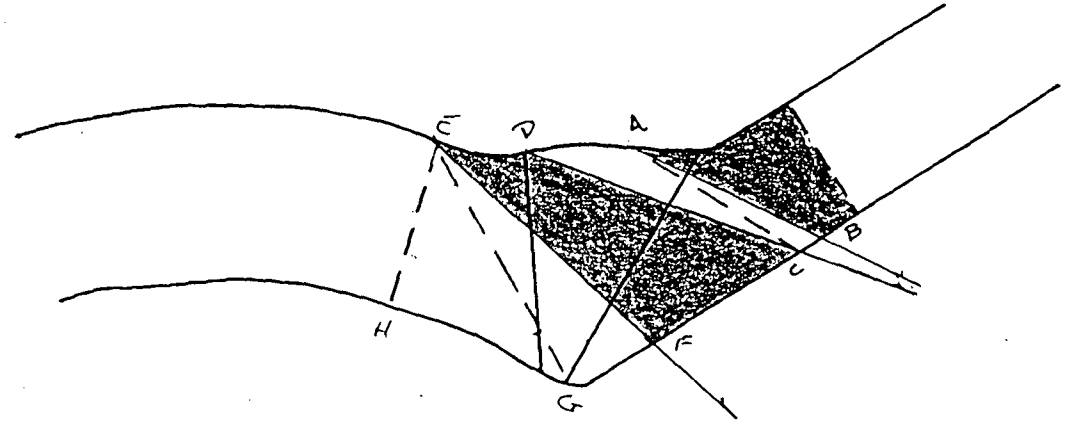
Other: _____ Level: _____ ANII Review: Nancy C Ritchie-Slaughter Date: 4/12/04

Comments: 2-LDCB-INLET-V1

CIRC. CONTOUR

AREA OF COVERAGE

Sketch or Photo:



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

TOTAL AREA: $1.111in^2$

60° AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: UT-04-152
Attachment: ~~Page:~~ 13 of 14

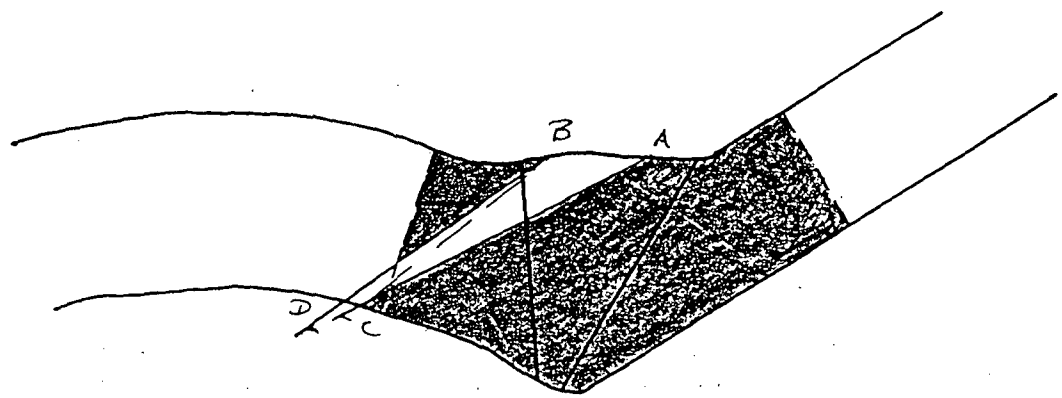
Summary No.: B03.150.003
Examiner: David K. Jr. Level: III Reviewer: JH Date: 4/9/04
Examiner: _____ Level: _____ Site Review: _____ Date: _____
Other: _____ Level: _____ ANII Review: Nancy C. Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-INLET-V1

CIRC. CONTOUR

Sketch or Photo:

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

Duke Energy.

Supplemental Report

Report No.: UT-04-152

Attachment: ~~Page:~~ 14 of 14

Summary No.: B03.150.003

Examiner: David K. B Level: III Reviewer: [signature] III Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

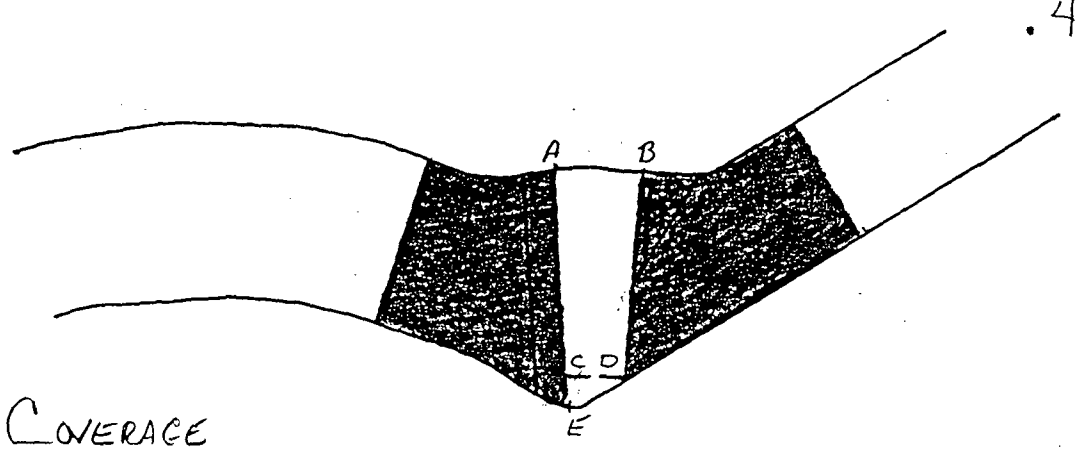
Comments: CIRC. SCAN:

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

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

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

Sketch or Photo:



$.44^2 IN.$ COVERAGE

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

FULL COVERAGE

NO COVERAGE

2-LDCB-INLET-V1

Duke Energy

UT Vessel Examination

Site/Unit: Oconee / 2 | Procedure: NDE-630 | Outage No.: ONS2EOC20
Summary No.: B03.150.004 | Procedure Rev.: 2 | Report No.: UT-04-153
Workscope: ISI | Work Order No.: 98603899 | Page: 1 of 2

Code: Asme Section XI 1989 | Cat./Item: B-D- /B3.150.4 | Location: N/A
Drawing No.: 1-34097-2 | Description: Nozzle to Channel Body
System ID: 51A
Component ID: B03.150.004 /2-LDCB-OUTLET-V2 | Size/Length: N/A | Thickness/Diameter: 0.875"/3.0"
Limitations: Yes- See attached limitation report. | Start Time: 0854 | Finish Time: 0950

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND
Lo Location: 9.2.2 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 03125
Temp. Tool Mfg.: FISHER | Serial No.: MCNDE32768 | Surface Temp.: 59 °F
Cal. Report No.: CAL-04-242, CAL-04-243, CAL-04-244, CAL-04-245

Angle Used	0	45	45T	60RL	60T	45RL
Scanning dB		40.5	40.5	63.5		66.5

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

Comments:
FC 99-02, 03-17, 03-30

Results: Accept ☑ Reject ☐ Info ☐ | Scanning db's less than ref.+14 to obtain 2:1 signal to noise ratio.
Percent Of Coverage Obtained > 90%: No-29.26% | Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Zimmerman, David K.	III	David K. Zimmerman	4/5/2004	JAM EATON III		4/9/04
Examiner	Level	Signature	Date	Site Review	Signature	Date
Mauldin, Larry E.	II	Larry E. Mauldin	4/5/2004			
Other	Level	Signature	Date	ANII Review	Signature	Date
				Nancy C. Ritchie Slaughter		4/12/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit:	Oconee / 2	Procedure:	NDE-630	Outage No.:	ONS2EOC20
Summary No.:	B03.150.004	Procedure Rev.:	2	Report No.:	UT-04-153
Workscope:	ISI	Work Order No.:	98603899	Page:	2 of 2

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: 4/05/04

_____ 4/9/04

DUKE POWER COMPANY
ISI LIMITATION REPORT

Component/Weld ID: 2-LDCB-OUTLET-V2 **Item No:** B03.150.004

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: 4/05/04 Sheet ~~2~~ 1 of ~~10~~ 14 *QE 4/9/04*

Reviewed By: *[signature]* III Date: 4/9/04 Authorized Inspector: *Nancy C. Ritchie Slaughter 4/12/04* Date:

ATTACHMENT TO UT-04-~~138~~ 153

Supplemental Report

Duke Energy

Report No.: UT-04-153

Attachment: ~~Page~~ 2 of 14

Summary No.: B03.150.004

Examiner: [signature] Level: III Reviewer: [signature] III Date: 4/9/04

Examiner: Level: Site Review: Date:

Other: Level: ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

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

Sketch or Photo:

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

SCAN	AXIAL AREA	CIRC. AREA	AVERAGE	PERCENT (AVE/ACT.)×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%

2-LDCB-OUTLET-V2

Duke Energy.

Supplemental Report

Report No.: UT-04-153

Attachment: ~~Page:~~ 3 of 14

Summary No.: B03.150.004

Examiner: [signature] Level: II Reviewer: [signature] III Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

Other: _____ Level: _____ ANII Review: Nancy C. Ritchie Slaughter Date: 4/12/04

Comments:

EXAM AREA:

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

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

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

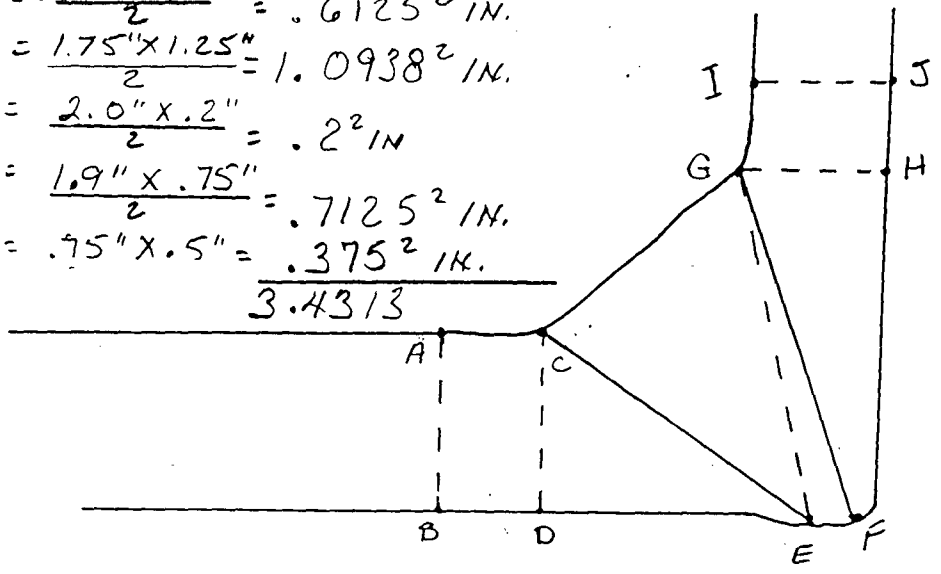
EFG = $\frac{2.0" X .2"}{2}$ = .2 ^{2} IN

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

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

3.4313

Sketch or Photo:



TOTAL EXAM AREA = 3.43 ^{2} IN.

2-LDCB-OUTLET-V2

Supplemental Report

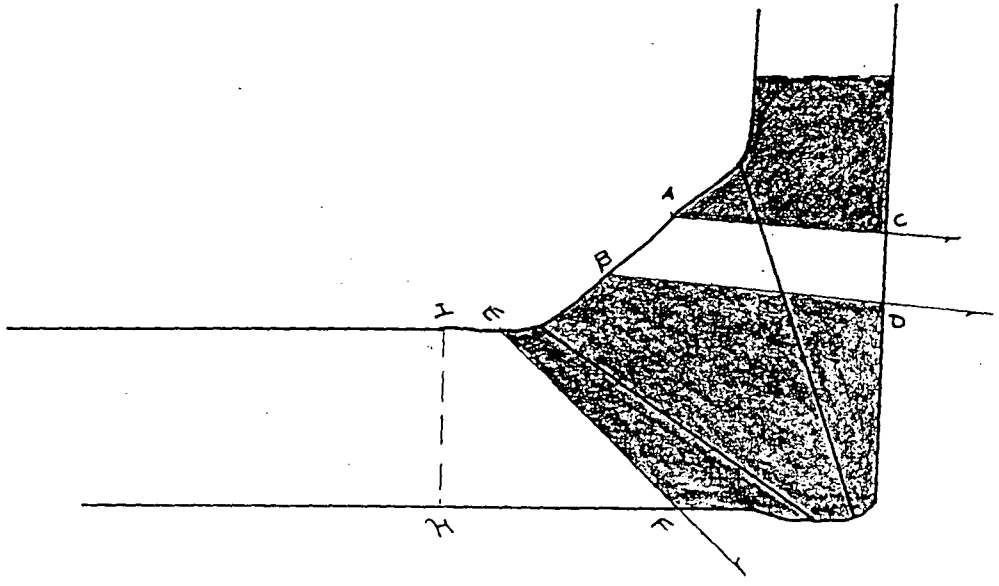
Report No.: UT-04-153
Attachment Page: 4 of 14

Summary No.: B03.150.004
Examiner: David K. [illegible] Level: III Reviewer: [illegible] III Date: 4/5/04
Examiner: _____ Level: _____ Site Review: _____ Date: _____
Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-OUTLET-V2

AXIAL CONTOUR

Sketch or Photo:



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

ke Energy.

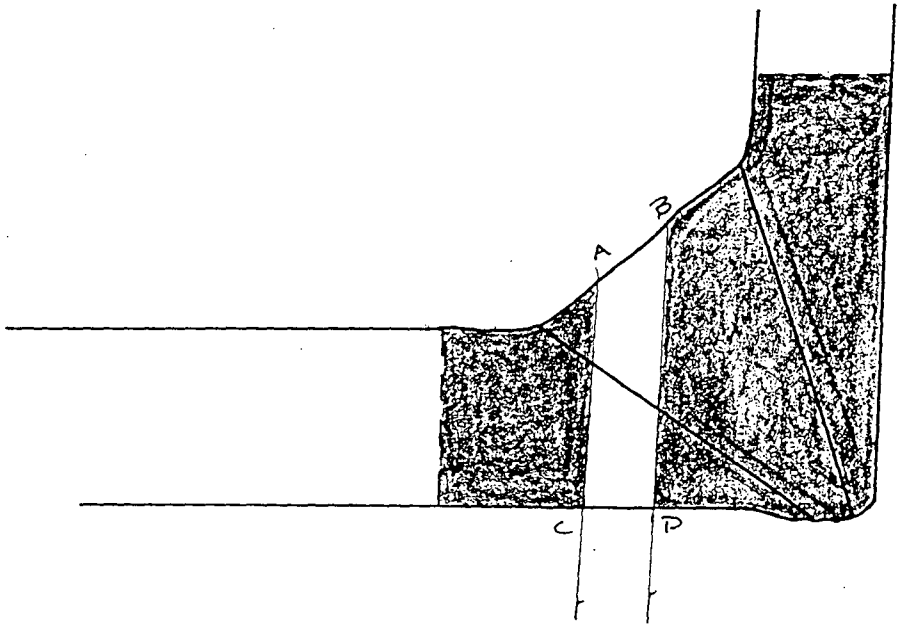
Supplemental Report

Report No.: UT-04-153
Attachment Page: 5 of 14

Summary No.: B03.150.004
Examiner: David K [illegible] Level: II Reviewer: [signature] III Date: 4/9/04
Examiner: _____ Level: _____ Site Review: _____ Date: _____
Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-OUTLET-V2

Sketch or Photo:



AXIAL CONTOUR

AREA OF COVERAGE

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

45° AXIAL - SCAN 2

FULL COVERAGE
NO COVERAGE

Supplemental Report

Report No.: UT-04-153
Attachment Page: 6 of 14

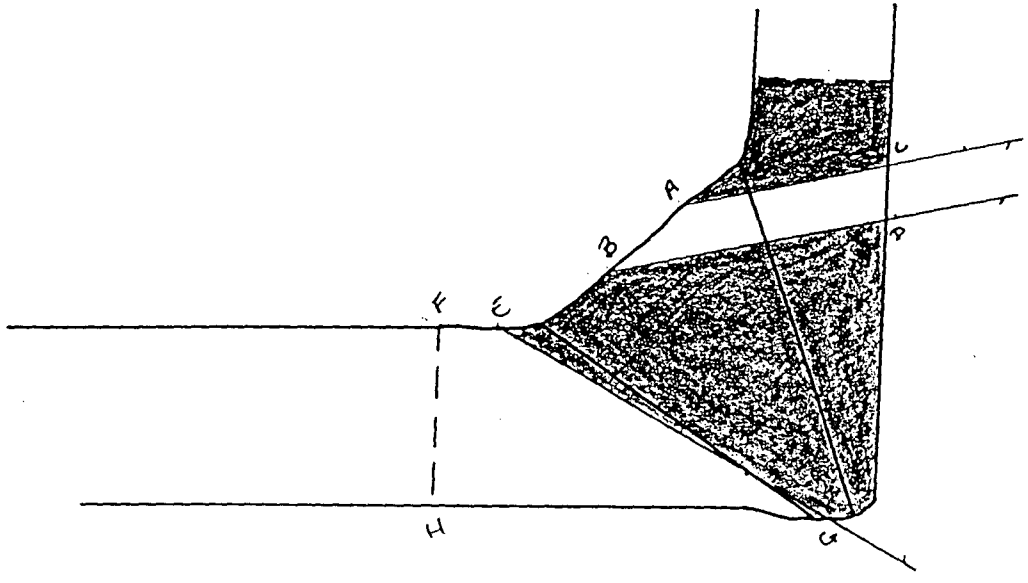
Summary No.: B03.150.004
Examiner: David K. Z — Level: III — Reviewer: [signature] III — Date: 4/9/04
Examiner: _____ — Level: _____ — Site Review: _____ — Date: _____
Other: _____ — Level: _____ — ANII Review: Nancy C Ritchie Stoughton — Date: 4/13/04

Comments: 2-LDCB-OUTLET-V2

AXIAL CONTOUR

AREA OF COVERAGE

Sketch or Photo:



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

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

$TOTAL\ AREA = 1.455in^2$

60° AXIAL - SCAN 1

FULL COVERAGE
NO COVERAGE

Duke Energy.

Supplemental Report

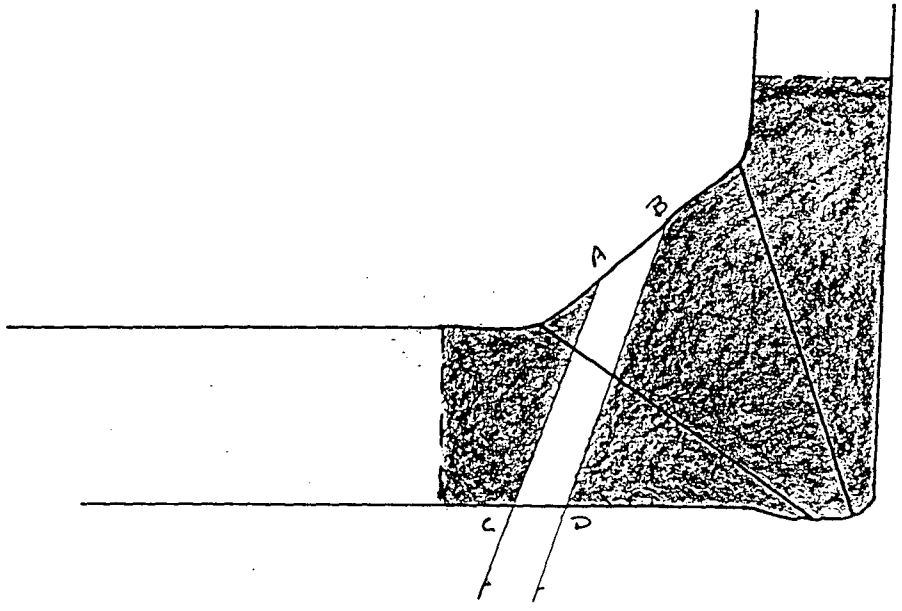
Report No.: UT-04-153
Attachment Page: 7 of 14

Summary No.: B03.150.004
Examiner: David K. B [illegible] Level: III Reviewer: [illegible] III Date: 4/9/04
Examiner: ____ Level: ____ Site Review: ____ Date: ____
Other: ____ Level: ____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-OUTLET-V2

AXIAL CONTOUR

Sketch or Photo:



AREA OF COVERAGE

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

60 AXIAL - SCAN 2

FULL COVERAGE
NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: VT-04-153
Attachment Page: 8 of 14

Summary No.: B03.150.004
Examiner: David K. B Level: III Reviewer: [signature] III Date: 4/9/04
Examiner: _____ Level: _____ Site Review: _____ Date: _____
Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

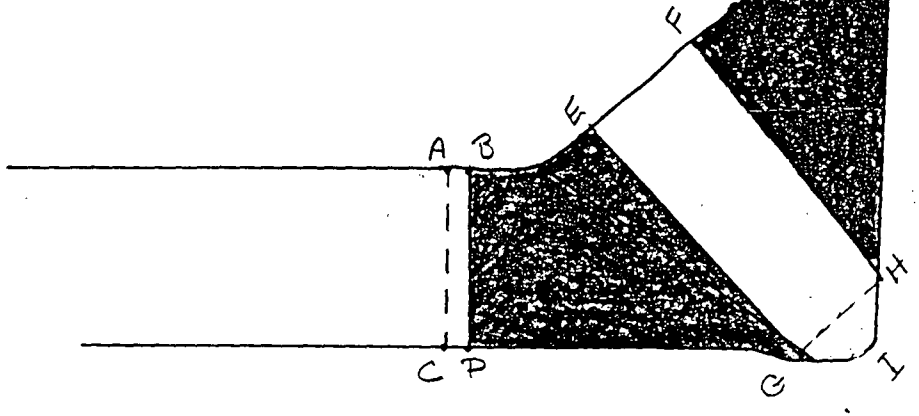
Comments: CIRC. SCAN:

AREA of COVERAGE:

ABCD = .875" X .1" = .0875 ^{2} IN.
EFGH = 1.6" X .7" = 1.12 ^{2} IN.
GHI = $\frac{.4" X .4"}{2}$ = .08 ^{2} IN.

} 1.29 ^{2} IN. COVERAGE

Sketch or Photo:



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

2-LDCB-OUTLET-V2

FULL COVERAGE
NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: UT-04-153

Attachment: ~~Page:~~ 9 of 14

Summary No.: B03.150.004

Examiner: David K Z — Level: III — Reviewer: [signature] III — Date: 4/9/04

Examiner: _____ — Level: _____ — Site Review: _____ — Date: _____

Other: _____ — Level: _____ — ANII Review: Nancy C Kitchel Slaughter — Date: 4/12/04

Comments:

Sketch or Photo:

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

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

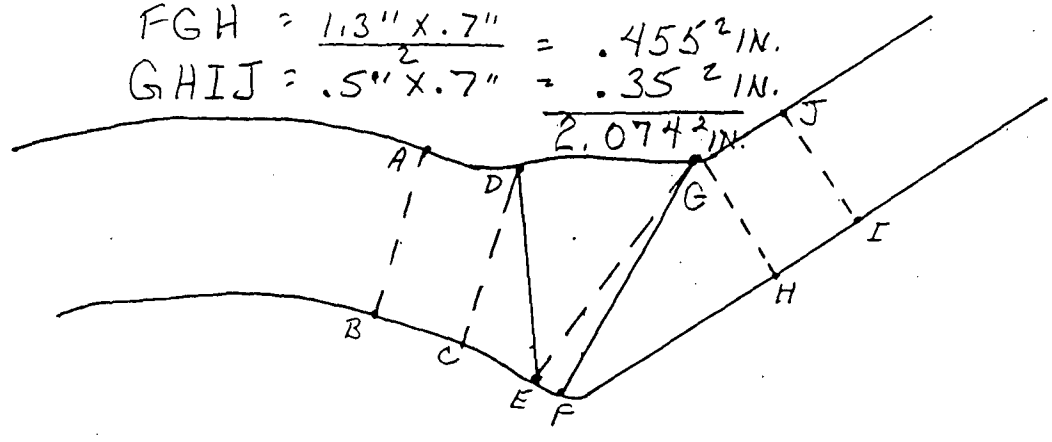
DEG = $\frac{1.4" \times .7"}{2}$ = .49 ^{2} IN.

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.

2-LDCB-OUTLET-V2

Supplemental Report

Report No.: VT-04-153
Attachment: ~~Page~~ 10 of 14

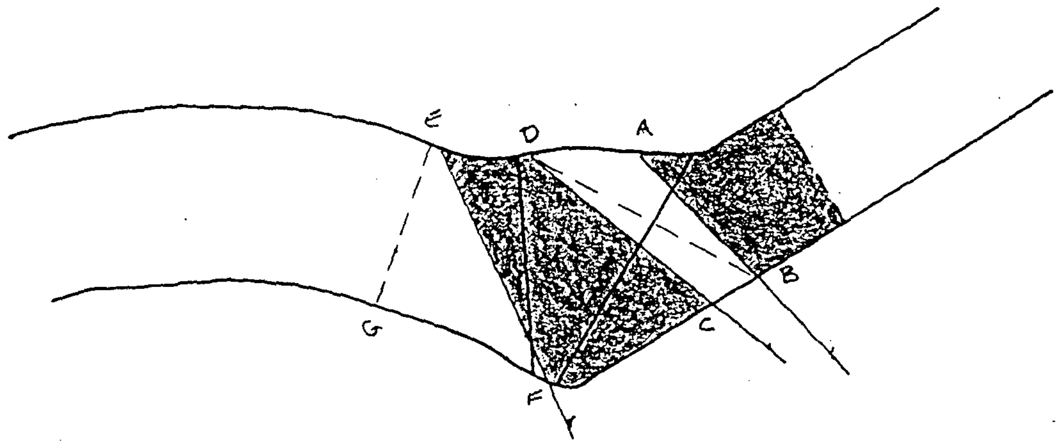
Summary No.: B03.150.004
Examiner: [signature] Level: III Reviewer: [signature] III Date: 4/9/04
Examiner: Level: Site Review: Date:
Other: Level: ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-OUTLET-V2

CIRC. CONTOUR

Sketch or Photo:

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 [shaded]

Duke Energy.

Supplemental Report

Report No.: UT-04-153

Attachment: ~~Page:~~ 11 of 14

Summary No.: B03.150.004

Examiner: David K Z Level: III Reviewer: [signature] III Date: 4/5/04

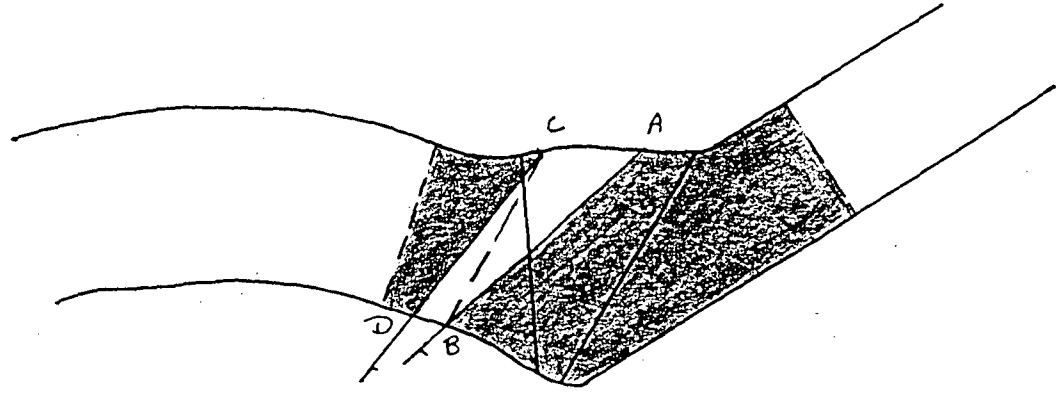
Examiner: _____ Level: _____ Site Review: _____ Date: _____

Other: _____ Level: _____ ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-OUTLET-V2 CIRC. CONTOUR

AREA OF COVERAGE

Sketch or Photo:



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

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

TOTAL AREA = $.385\text{in}^2$

45° AXIAL - SCAN 2

FULL COVERAGE

NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: UT-04-153

Attachment: ~~Page~~ 12 of 14

Summary No.: B03.150.004

Examiner: David K. Z. Level: III Reviewer: [signature] III Date: 4/9/04

Examiner: _____ Level: _____ Site Review: _____ Date: _____

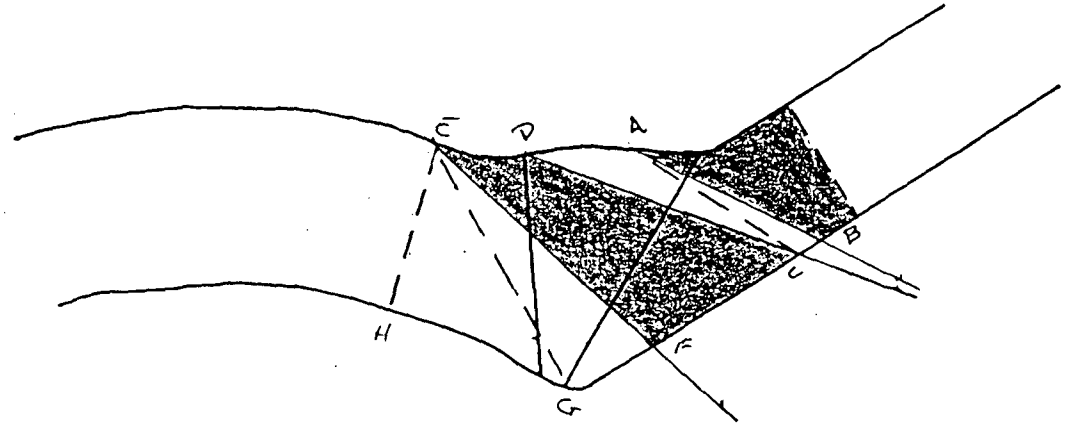
Other: _____ Level: _____ ANII Review: Nancy C. K. Tetter Slaughter Date: 4/12/04

Comments: 2-LTDCB-OUTLET-V2

CIRC. CONTOUR

AREA OF COVERAGE

Sketch or Photo:



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

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

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

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

TOTAL AREA: 1.111in^2

60° AXIAL - SCAN 1

FULL COVERAGE

NO COVERAGE

Duke Energy.

Supplemental Report

Report No.: UT-04-153
Attachment: ~~Page~~ 13 of 14

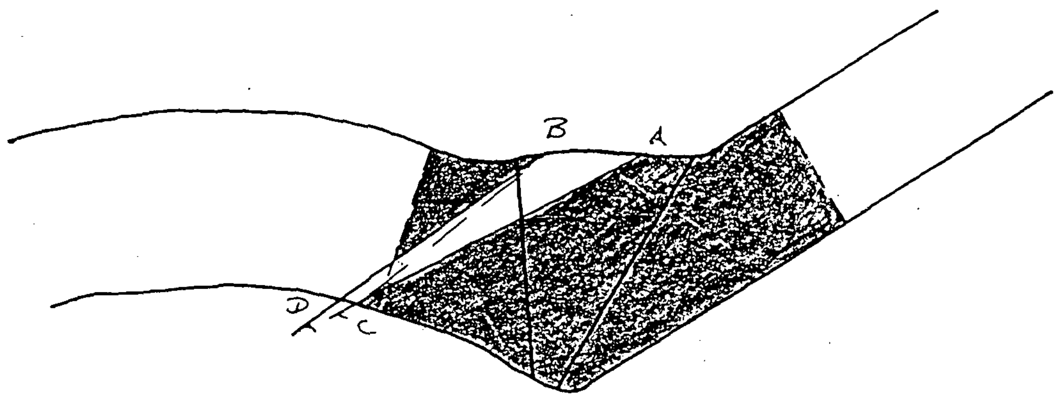
Summary No.: B03.150.004
Examiner: [signature] Level: III Reviewer: [signature] III Date: 4/5/04
Examiner: Level: Site Review: Date:
Other: Level: ANII Review: Nancy C Ritchie Slaughter Date: 4/12/04

Comments: 2-LDCB-OUTLET-V2

CIRC. CONTOUR

Sketch or Photo:

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

Duke Energy.

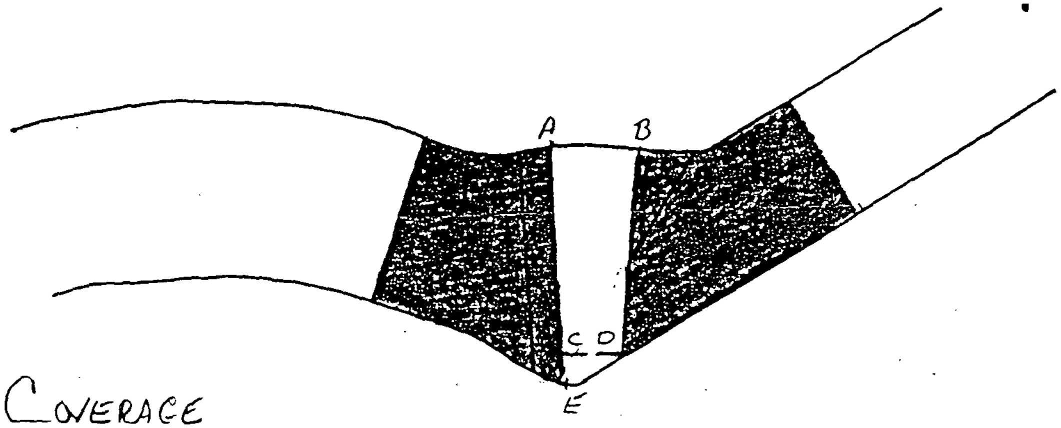
Supplemental Report

Report No.: UT-04-153
Attachment: ~~Page~~ 14 of 14

Summary No.:	B03.150.004				
Examiner:	[signature]	Level:	III	Reviewer: [signature] III	Date: 4/9/04
Examiner:		Level:		Site Review:	Date:
Other:		Level:		ANII Review: Nancy C Ritchie Slaughter	Date: 4/12/04

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.

Sketch or Photo:



.44 ^{2} IN. COVERAGE

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

FULL COVERAGE
NO COVERAGE

2-LDCB-OUTLET-V2

Duke Energy

UT Base Met. Examination

Site/Unit: Oconee / 2 | Procedure: NDE-640 | Outage No.: ONS2EOC20
Summary No.: B09.011.017 | Procedure Rev.: 2 | Report No.: UT-04-108
Workscope: ISI | Work Order No.: 98604011 | Page: 1 of 2

Code: Asme Section XI 1989 | Cat./Item: B-J- /B9.11.17 | Location: N/A
Drawing No.: 2HP-215 | Description: Tee to Reducer
System ID: 51A
Component ID: B09.011.017 /2HP-215-3 | Size/Length: N/A | Thickness/Diameter: 0.531"/4"
Limitations: NONE | Start Time: 1050 | Finish Time: 1057

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: GROUND
Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 03125
Temp. Tool Mfg.: FISHER | Serial No.: MCNDE32768 | Surface Temp.: 71 °F | Scanning dB: 55.7
Cal. Report No.: CAL-04-193

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ | Initial Section XI Examination
Percent Of Coverage Obtained > 90%: Yes-100% | Reviewed Previous Data: No

Examiner Level III Eaton, Jay A.	Signature	Date 3/30/2004	Reviewer Gary Moss	Signature	Date 4-1-04
Examiner Level	Signature	Date	Site Review	Signature	Date
Other Level	Signature	Date	ANII Review	Signature Nancy C Ritchie Laughter	Date 4/6/04

Duke Energy

Supplemental Report

Report No.: UT-04-108

Page: 2 of 2

Summary No.: B09.011.017

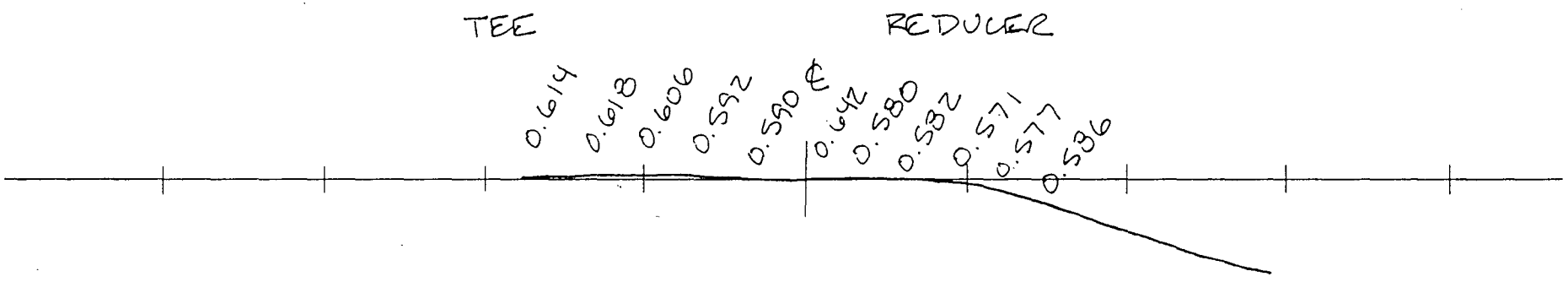
Examiner: Eaton, Jay A. Level: III Reviewer: Gary J Moss Date: 4-1-04

Examiner: Level: Site Review: Date:

Other: Level: ANII Review: Nancy C Ritchie-Slaughter Date: 4/6/04

Comments:

Sketch or Photo: C:\Documents and Settings\kbertoc\My Documents\PaintLine4.jpg



Duke Energy

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	B09.011.017	Procedure Rev.:	15	Report No.:	UT-04-109
Workscope:	ISI	Work Order No.:	98604011	Page:	1 of 3

Code: Asme Section XI 1989 Cat./Item: B-J- /B9.11.17 Location: N/A

Drawing No.: 2HP-215 Description: Tee to Reducer

System ID: 51A

Component ID: B09.011.017 /2HP-215-3 Size/Length: N/A Thickness/Diameter: 0.531"/4"

Limitations: Yes - See attached limitation report Start Time: 1103 Finish Time: 1124

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.: MCNDE32768 Surface Temp.: 71 °F

Cal. Report No.: CAL-04-194, CAL-04-195, CAL-04-196

Angle Used	0	45	45T	60	60L	
Scanning dB			50.3	54.7	61.5	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Examination

Percent Of Coverage Obtained > 90%: No - 88.8% Reviewed Previous Data: No

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Eaton, Jay A.			3/30/2004		Gary Mon		4-2-04
Examiner	Level	Signature	Date	Site Review		Signature	Date
Other	Level	Signature	Date	ANII Review		Signature	Date
					Nancy C. Ritchie Slaughter		4/6/04

Duke Energy

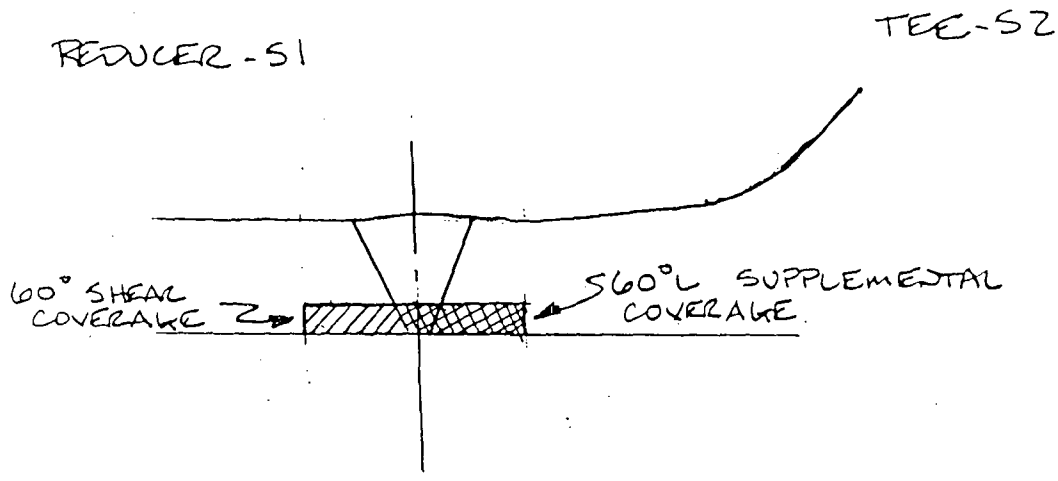
Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	B09.011.017	Procedure Rev.:	15	Report No.:	UT-04-109
Workscope:	ISI	Work Order No.:	98604011	Page:	2 of 3

Description of Limitation:

Limited in the throat of the tee on the ~~52~~ S2 side of the weld with the 60° shear wave. Lo + 5.0" to Lo + 9.0"
9c 3/30/04

Sketch of Limitation:



TOTAL EXAM AREA = .177 x 1.2 = .21 in²

60° SHEAR COVERAGE = $\frac{.5 + .55}{2}$ x .177 = .09 / .21 x100 = 42.8%

60° L SUPPLEMENTAL COVERAGE = 100% - 42.8% = 57.2%

Limitations removal requirements:

Radiation field:

Examiner	Level	Signature	Date	Reviewer		Signature	Date
JAY EATON III			3/30/04	David K. [illegible]			4/5/04
Examiner	Level	Signature	Date	Site Review		Signature	Date
Other	Level	Signature	Date	ANII Review		Signature	Date
				Nancy C. Ritchie Slaughter			4/6/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	B09.011.017	Procedure Rev.:	15	Report No.:	UT-04-109
Workscope:	ISI	Work Order No.:	98604011	Page:	3 of 3

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	71.600	% Length X	100.000	% volume of length / 100 =	71.600	% total for Scan 1
Scan 2	71.600	% Length X	100.000	% volume of length / 100 =	71.600	% total for Scan 2
Scan 3	28.400	% Length X	42.800	% volume of length / 100 =	12.155	% total for Scan 3
Scan 4	28.400	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 4

qf 3/30/04

Percent complete coverage

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

88.839 **% Total for complete exam**

Site Field Supervisor: [signature] III Date: 3/30/04

NOTE: 60° RL SCAN NOT INCLUDED IN PERCENT COVERAGE BECAUSE OF THE REQUIREMENTS OF 10CFR 50.55a(b)(2)(xv)(A)(2). BEST EFFORT SCAN WITH 60° RL OBTAINED 57.2% COVERAGE IN ONE AXIAL DIRECTION.

Duke Energy

UT Base Met. Lamination

Site/Unit:	Oconee / 2	Procedure:	NDE-640	Outage No.:	ONS2EOC20
Summary No.:	C05.021.021	Procedure Rev.:	2	Report No.:	UT-04-013
Workscope:	ISI	Work Order No.:	98606481	Page:	1 of 2

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.21 Location: N/A

Drawing No.: 2-51A-17 (2) Description: Pipe to Valve (Valve 2HP-118)

System ID: 51A

Component ID: C05.021.021 /2-51A-17-124 Size/Length: N/A Thickness/Diameter: 4.0" / .531

Limitations: None Start Time: 0957 Finish Time: 1000

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

Lo Location: 9.1.1.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F Scanning dB: 60

Cal. Report No.: CAL-04-019

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

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

Examiner Level III Eaton, Jay A.	Signature	Date 2/9/2004	Reviewer	Signature	Date 2-11-04
Examiner Level II Jordan, Joey	Signature	Date 2/9/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review	Signature	Date 2/27/04

Duke Energy

Supplemental Report

Report No.: UT-04-013

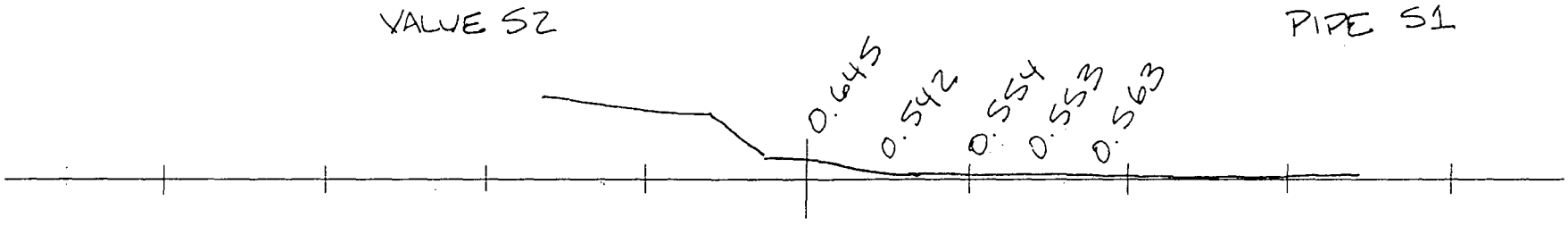
Page: 2 of 2

Summary No.: C05.021.021

Examiner:	Eaton, Jay A.	Level:	III	Reviewer:	Gary Moss — Date: 2-11-04
Examiner:	Jordan, Joey	Level:	II	Site Review:	Date:
Other:	N/A	Level:	N/A	ANII Review:	Date: 2/27/04

Comments:

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



Duke Energy

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.021	Procedure Rev.:	15	Report No.:	UT-04-016
Workscope:	ISI	Work Order No.:	98606481	Page:	1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.21 Location: N/A

Drawing No.: 2-51A-17 (2) Description: Pipe to Valve (Valve 2HP-118)

System ID: 51A

Component ID: C05.021.021 /2-51A-17-124 Size/Length: N/A Thickness/Diameter: 4.0" / .531

Limitations: Yes-See Attached Limitation Report Start Time: 1000 Finish Time: 1040

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

Lo Location: 9.1.1.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F

Cal. Report No.: CAL-04-022, CAL-04-026, CAL-04-030

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

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

Percent Of Coverage Obtained > 90%: No - 34.5% Reviewed Previous Data: No

Examiner Eaton, Jay A.	Level III	Signature	Date 2/9/2004	Reviewer	Gary Moss	Signature	Date 2-11-04
Examiner Jordan, Joey	Level II	Signature	Date 2/9/2004	Site Review		Signature	Date
Other	Level	Signature	Date	ANII Review		Signature	Date 2/27/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.021	Procedure Rev.:	15	Report No.:	UT-04-016
Workscope:	ISI	Work Order No.:	98606481	Page:	2 of 3

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	38.100	% volume of length / 100 =	38.100	% total for Scan 1
Scan 2	100.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

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

34.525 **% Total for complete exam**

Site Field Supervisor: [signature] III Date: 2/9/04

NOTE: 60° RL SCAN NOT INCLUDED IN PERCENT COVERAGE BECAUSE OF THE REQUIREMENTS OF 10CFR50.55a(b)(2)(xv)(A)(2) BEST EFFORT SCAN WITH 60° RL OBTAINED 61.9% COVERAGE IN ONE AXIAL DIRECTION.

Duke Energy

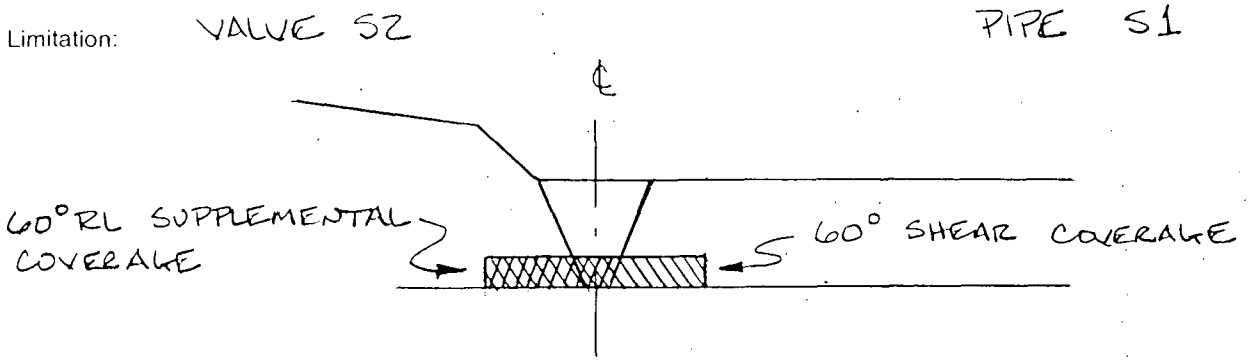
Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.021	Procedure Rev.:	15	Report No.:	UT-04-016
Workscope:	ISI	Work Order No.:	98606481	Page:	3 of 3

Description of Limitation:

Limited Due to Valve Configuration

Sketch of Limitation:



TOTAL EXAM AREA .18 x 1.15 = .21 in²

60° SHEAR COVERAGE = $\frac{0.4 + 0.5}{2}$ x .18 = .08 / .21 x 100 = 38.1%

60° RL COVERAGE = .21 - .08 = .13 / .21 x 100 = 61.9%

45° CW & CCW COVERAGE = .21 ÷ 2 = .105 / .21 x 100 = 50%

Limitations removal requirements:

N/A

Radiation field: N/A

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Eaton, Jay A.			2/9/2004		Gary Moss		2-11-04
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Jordan, Joey			2/9/2004				
Other	Level	Signature	Date	ANII Review		Signature	Date
							2/27/04

Duke Energy

UT Base Met. Lamination

Site/Unit: Oconee / 2 | Procedure: NDE-640 | Outage No.: ONS2EOC20
Summary No.: C05.021.022 | Procedure Rev.: 2 | Report No.: UT-04-014
Workscope: ISI | Work Order No.: 98606481 | Page: 1 of 2

Code: Asme Section XI 1989 | Cat./Item: C-F-1/C5.21.22 | Location: N/A
Drawing No.: 2-51A-17 (2) | Description: Valve (2HP-115) to Tee
System ID: 51A
Component ID: C05.021.022 /2-51A-17-92 | Size/Length: N/A | Thickness/Diameter: 4.0" / .531
Limitations: None | Start Time: 0953 | Finish Time: 0957

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND
Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 01225
Temp. Tool Mfg.: FISHER | Serial No.: MCNDE 27219 | Surface Temp.: 97 °F | Scanning dB: 60
Cal. Report No.: CAL-04-019

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ | Initial Section XI Inspection
Percent Of Coverage Obtained > 90%: Yes-100% | Reviewed Previous Data: No

Examiner Eaton, Jay A.	Level III	Signature	Date 2/9/2004	Reviewer	Gary Moss	Signature	Date 2-11-04
Examiner Jordan, Joey	Level II	Signature	Date 2/9/2004	Site Review		Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review		Signature	Date 2/27/04

Duke Energy

Supplemental Report

Report No.: UT-04-014

Page: 2 of 2

Summary No.: C05.021.022

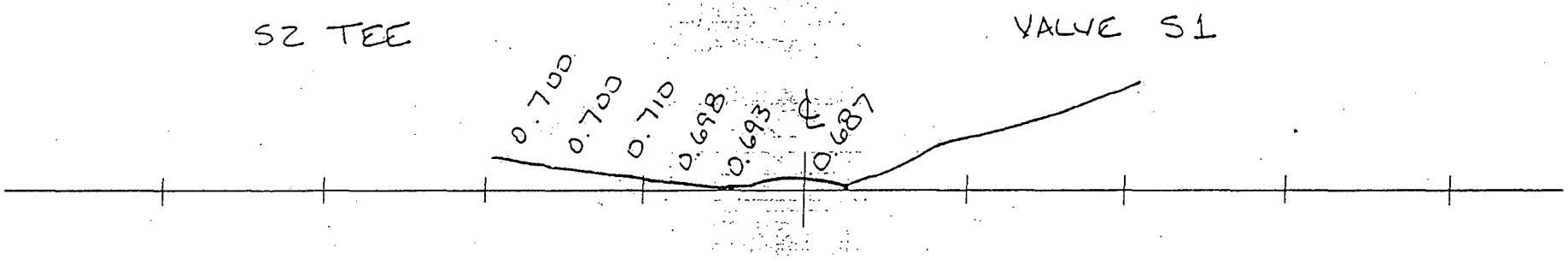
Examiner: Eaton, Jay A. Level: III Reviewer: Gary Mon Date: 2-11-04

Examiner: Jordan, Joey Level: II Site Review: Date:

Other: N/A Level: N/A ANII Review: Date: 2/27/04

Comments:

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



Duke Energy

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.022	Procedure Rev.:	15	Report No.:	UT-04-017
Workscope:	ISI	Work Order No.:	98606481	Page:	1 of 5

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.22 Location: N/A

Drawing No.: 2-51A-17 (2) Description: Valve (2HP-115) to Tee

System ID: 51A

Component ID: C05.021.022 /2-51A-17-92 Size/Length: N/A Thickness/Diameter: 4.0" / .531

Limitations: Yes-See Attached Limitation Report Start Time: 1000 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.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F

Cal. Report No.: CAL-04-022, CAL-04-026, CAL-04-030

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

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ ONS ANII 9-26-07 Initial Section XI Inspection

Percent Of Coverage Obtained > 90%: No - 34.5% 9-25-07 Reviewed Previous Data: No

Examiner Level III Eaton, Jay A.	Signature	Date 2/9/2004	Reviewer	Signature	Date 2-11-04
Examiner Level II Jordan, Joey	Signature	Date 2/9/2004	Site Review	Signature	Date
Other Level	Signature	Date	ANII Review	Signature	Date 2/27/04

Duke Energy

Ultrasonic Indication Report

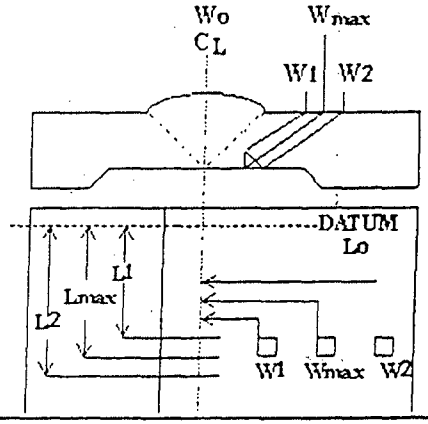
Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.022	Procedure Rev.:	15	Report No.:	UT-04-017
Workscope:	ISI	Work Order No.:	98606481	Page:	2 of 5

Search Unit Angle: 60 RL °

Wo Location: C/L of Weld

Lo Location: 9.1.1.1

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



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

Comments:

Scan #	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
S2	1	80%	0.7	1.0"	N/A	N/A	N/A	N/A	360°	0-1"	Int.	N/A	ID Geometry

Examiner Level III Eaton, Jay A.	Signature	Date 2/9/2004	Reviewer Gary Moss	Signature	Date 2-11-04
Examiner Level II Jordan, Joey	Signature	Date 2/9/2004	Site Review	Signature	Date
Other Level	Signature	Date	ANII Review	Signature	Date 2/27/04

Duke Energy.

Supplemental Report

Report No.: UT-04-017

Page: 3 of 5

Summary No.: C05.021.022

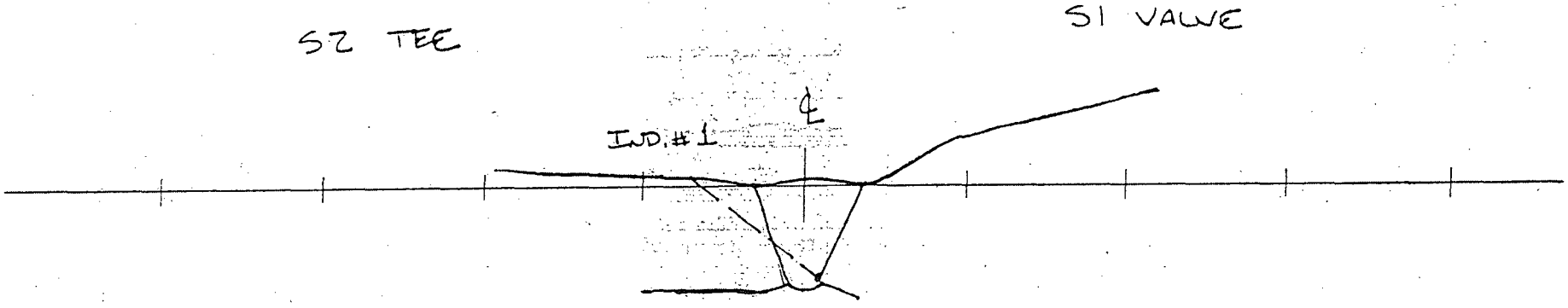
Examiner: Eaton, Jay A. Level: III Reviewer: Dan Morr Date: 2-11-04

Examiner: Jordan, Joey Level: II Site Review: Date:

Other: Level: ANII Review: Date: 2/27/04

Comments: Ind. # 1 - 60°L is a geometric reflector from the weld root. This was verified by plotting the indication. There was no response at this location from the 60° and 70° shear waves.

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



IDDEAL®
software suite

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	ONS 1 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.022	Procedure Rev.:	15	Report No.:	UT-04-017
Workscope:	151	Work Order No.:	98606481	Page:	4 of 5

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	50	% volume of length / 100 =	50	% total for Scan 3
Scan 4	100	% Length X	50	% volume of length / 100 =	50	% total for Scan 4

Add totals and divide by # scans = 50 **% 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	50	% volume of length / 100 =	50	% 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;

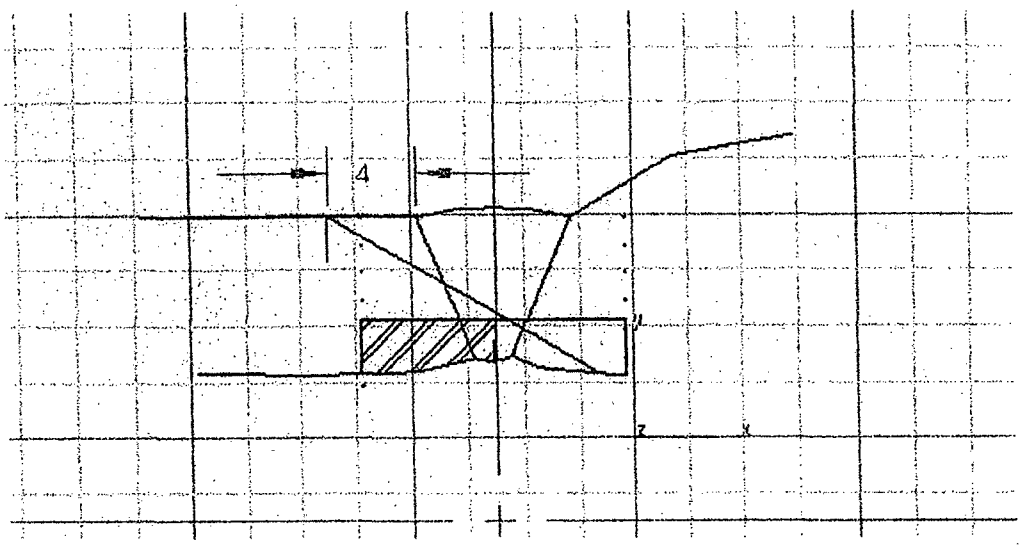
37.5 **% Total for complete exam**

Site Field Supervisor: James J. McArdle III Date: 9-19-07

[signature] ANII 9-26-07

4 of 5

ONS 2 C05.021.022
All dimensions are in inches



60° shear wave beam covered 50% of the required volume in one axial direction from the Tee side. (Cross hatched area)

$.254 \div 2 = .127 sq.in.$

$.127 \div .254 \times 100 = 50\%$

45° shear wave beam covered 50% of the required volume in two circumferential and two tangential directions. (Cross hatched area)

60° RL beam covered 0.048 sq. in. on the valve side of the weld. This equates to 18.89% of the required examination volume.

$.048 \div .254 \times 100 = 18.89\%$ CMB ANII 9-26-07

This limitation was caused by the valve configuration which prevents scanning on the valve side of the weld. Reported coverage is the aggregate of all scans performed on the weld.

Duke Energy

UT Base Met. Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-640	Outage No.:	ONS2EOC20
Summary No.:	C05.021.023	Procedure Rev.:	2	Report No.:	UT-04-026
Workscope:	ISI	Work Order No.:	98606488	Page:	1 of 2

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.23 Location: N/A

Drawing No.: 2-51A-17 (3) Description: Valve (2HP-118) to Elbow

System ID: 51A

Component ID: C05.021.023 /2-51A-17-125 Size/Length: N/A Thickness/Diameter: 4.0" / .531

Limitations: None Start Time: 0905 Finish Time: 0908

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

Lo Location: 9.1.1.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F Scanning dB: 62

Cal. Report No.: CAL-04-042

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

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

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Eaton, Jay A.			2/10/2004				2-11-04
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Jordan, Joey			2/10/2004				
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Nancy C. Ritchie Slaughter	3/2/04

Duke Energy

Supplemental Report

Report No.: UT-04-026

Page: 2 of 2

Summary No.: C05.021.023

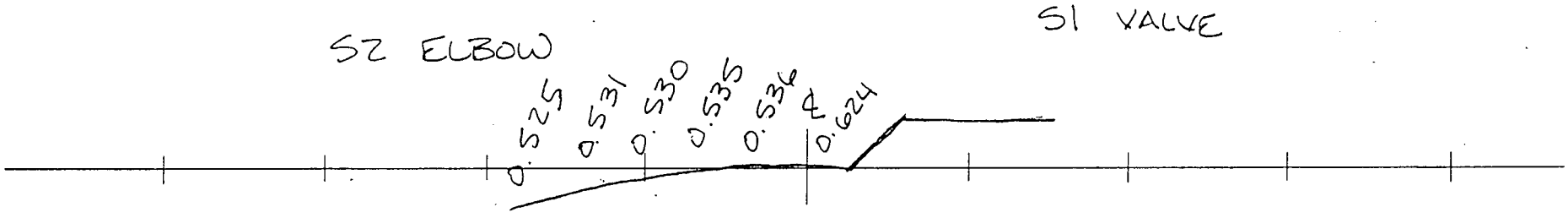
Examiner: Eaton, Jay A. Level: III Reviewer: Gary Moss Date: 2-11-04

Examiner: Jordan, Joey Level: II Site Review: Date:

Other: N/A Level: N/A ANII Review: Nancy C. Ritchie-Slaughter Date: 3/2/04

Comments:

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



Duke Energy

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.023	Procedure Rev.:	15	Report No.:	UT-04-030
Workscope:	ISI	Work Order No.:	98606488	Page:	1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.23 Location: N/A

Drawing No.: 2-51A-17 (3) Description: Valve (2HP-118) to Elbow

System ID: 51A

Component ID: C05.021.023 /2-51A-17-125 Size/Length: N/A Thickness/Diameter: 4.0" / .531

Limitations: Yes-See Attached Limitation Report Start Time: 0925 Finish Time: 0955

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

Lo Location: 9.1.1.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F

Cal. Report No.: CAL-04-043, CAL-04-045, CAL-04-048

Angle Used	0	45	45T	60	60L	
Scanning dB			61	62	57	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

Percent Of Coverage Obtained > 90%: No - 34.5% Reviewed Previous Data: No

Examiner Level III Eaton, Jay A.	Signature	Date 2/10/2004	Reviewer Gary A. Moss	Signature	Date 2-11-04
Examiner Level II Jordan, Joey	Signature	Date 2/10/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review Nancy C. Ritchie Slaughter	Signature	Date 3/2/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.023	Procedure Rev.:	15	Report No.:	UT-04-030
Workscope:	ISI	Work Order No.:	98606488	Page:	2 of 3

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	38.100	% volume of length / 100 =	38.100	% total for Scan 1
Scan 2	100.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

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

34.525 **% Total for complete exam**

Site Field Supervisor: [signature] III Date: 2/10/04

NOTE: 60° RL SCAN NOT INCLUDED IN PERCENT COVERAGE CAUSE OF THE REQUIREMENTS OF 10CFR 50.55a(b)(2)(xv)(A)(2) BEST EFFORT E. SCAN WITH 60° RL OBTAINED 61.9 % COVERAGE IN ONE AXIAL DIRECTION. RL 2/10/04

Duke Energy

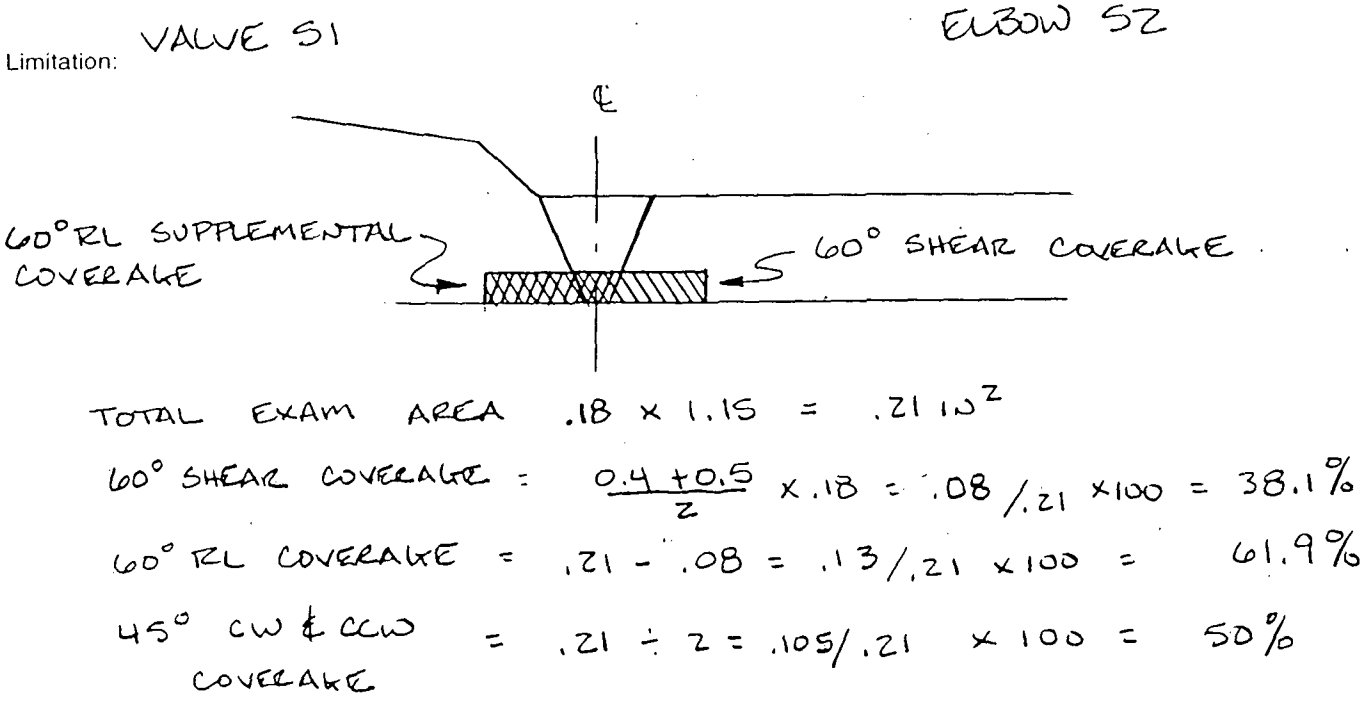
Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.023	Procedure Rev.:	15	Report No.:	UT-04-030
Workscope:	ISI	Work Order No.:	98606488	Page:	3 of 3

Description of Limitation:

Limited due to Valve Configuration.

Sketch of Limitation:



TOTAL EXAM AREA .18 x 1.15 = .21 in²

60° SHEAR COVERAGE = $\frac{0.4 + 0.5}{2}$ x .18 = .08 / .21 x 100 = 38.1%

60° RL COVERAGE = .21 - .08 = .13 / .21 x 100 = 61.9%

45° CW & CCW COVERAGE = .21 ÷ 2 = .105 / .21 x 100 = 50%

Limitations removal requirements:

N/A

Radiation field: **N/A**

Examiner **Eaton, Jay A.**	Level III	Signature	Date 2/10/04 ~~2/9/2004~~	Reviewer 2/10/04	Signature Gary Moss	Date 2-11-04
Examiner **Jordan, Joey**	Level II	Signature	Date 2/10/04 ~~2/9/2004~~	Site Review 2/10/04	Signature	Date
Other	Level	Signature	Date	ANII Review Nancy C Ritchie Slaughter	Signature	Date 3/2/04

Duke Energy

UT Base Met. Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-640	Outage No.:	ONS2EOC20
Summary No.:	C05.021.051	Procedure Rev.:	2	Report No.:	UT-04-015
Workscope:	ISI	Work Order No.:	98606478	Page:	1 of 2

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.51 Location: N/A

Drawing No.: 2-51A-17 (1) Description: Pipe to Valve (2LP-56)

System ID: 51A

Component ID: C05.021.051 /2-51A-17-20A Size/Length: N/A Thickness/Diameter: 3.0" / .216

Limitations: None Start Time: 0950 Finish Time: 0953

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

Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F Scanning dB: 58

Cal. Report No.: CAL-04-021

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

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

Examiner Level III Eaton, Jay A.	Signature	Date 2/9/2004	Reviewer	Signature	Date 2-11-04
Examiner Level II Jordan, Joey	Signature	Date 2/9/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review	Signature Nancy C Ritchie Slaughter	Date 3/2/04

Duke Energy

Supplemental Report

Report No.: UT-04-015

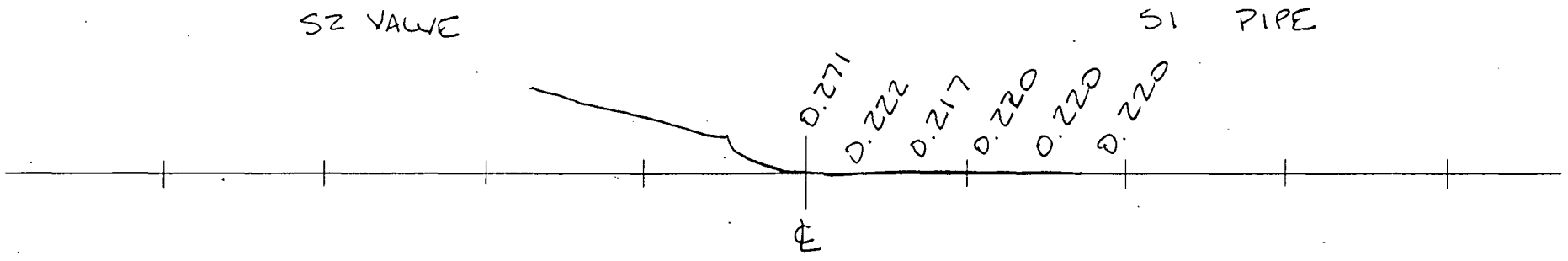
Page: 2 of 2

Summary No.: C05.021.051

Examiner:	Eaton, Jay A.		Level:	III	Reviewer:	Gary Moss	Date: 2-11-04
Examiner:	Jordan, Joey		Level:	II	Site Review:		Date:
Other:	N/A		Level:	N/A	ANII Review:	Nancy C Ritchie/Slaughter	Date: 3/2/04

Comments:

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



Duke Energy

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.051	Procedure Rev.:	15	Report No.:	UT-04-018
Workscope:	ISI	Work Order No.:	98606478	Page:	1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.51 Location: N/A

Drawing No.: 2-51A-17 (1) Description: Pipe to Valve (2LP-56)

System ID: 51A

Component ID: C05.021.051 /2-51A-17-20A Size/Length: N/A Thickness/Diameter: 3.0" / .216

Limitations: Yes-See Attached Lkimitation Report Start Time: 1010 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.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F

Cal. Report No.: CAL-04-024, CAL-04-028, CAL-04-029

Angle Used	0	45	45T	60	70	
Scanning dB			56	60	63	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

Percent Of Coverage Obtained > 90%: No - 35.2% Reviewed Previous Data: No

Examiner Eaton, Jay A.	Level III	Signature	Date 2/9/2004	Reviewer	Signature		Date 2-11-04
Examiner Jordan, Joey	Level II	Signature	Date 2/9/2004	Site Review	Signature		Date
Other N/A	Level N/A	Signature	Date	ANII Review	Signature Nancy C. Ritchie Slaughter		Date 3/2/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.051	Procedure Rev.:	15	Report No.:	UT-04-018
Workscope:	ISI	Work Order No.:	98606478	Page:	2 of 3

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	40.600	% volume of length / 100 =	40.600	% total for Scan 1
Scan 2	100.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

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

35.150 **% Total for complete exam**

Site Field Supervisor: [signature] III Date: 2/9/04

NOTE: 70° SHEAR SCAN NOT INCLUDED IN PERCENT COVERAGE BECAUSE OF THE REQUIREMENTS OF 10CFR50.55a(b)(2)(xv)(A)(2 BEST EFFORT SCAN WITH 70° SHEAR OBTAINED 59.4% COVERAGE IN ONE AXIAL DIRECTION.

Duke Energy

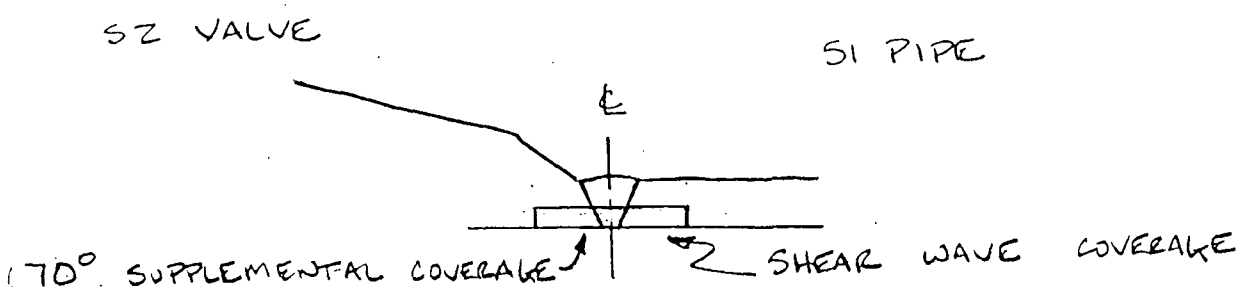
Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
ummary No.:	C05.021.051	Procedure Rev.:	15	Report No.:	UT-04-018
Workscope:	ISI	Work Order No.:	98606478	Page:	3 of 3

Description of Limitation:

Limited Due to Valve Configuration

Sketch of Limitation:



TOTAL EXAM AREA = 0.8 X .072 = .0576 IN^2

60° SHEAR COVERAGE = $\frac{0.3 + 0.35}{2}$ X .072 = .0234/.0576 X100 = 40.6%

70° SHEAR COVERAGE = .0576 - .0234 = .0342/.0576 X100 = 59.4%

45° CW & CCW COVERAGE = .0576 ÷ 2 = .0288/.0576 X100 = 50%

Limitations removal requirements:

N/A

Radiation field: N/A

Examiner Level III Eaton, Jay A.	Signature	Date 2/9/2004	Reviewed	Signature Dan Moss	Date 2-11-04
Examiner Level II Jordan, Joey	Signature	Date 2/9/2004	Site Review	Signature	Date
'her Level N/A N/A	Signature	Date	ANII Review	Signature Nancy C Ritchie Slaughter	Date 3/2/04

Lake Energy

UT Base Met. Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-640	Outage No.:	ONS2EOC20
Summary No.:	C05.021.054	Procedure Rev.:	2	Report No.:	UT-04-027
Workscope:	ISI	Work Order No.:	98606499	Page:	1 of 2

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.54 Location: N/A

Drawing No.: 2-51A-17 (4) Description: Tee to Pipe

System ID: 51A

Component ID: C05.021.054 /2-51A-17-102 Size/Length: N/A Thickness/Diameter: 3.0" / .438

Limitations: None Start Time: 0913 Finish Time: 0916

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

Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F Scanning dB: 62

Cal. Report No.: CAL-04-031

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

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

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Eaton, Jay A.			2/10/2004		Gary Moss		2-11-04
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Jordan, Joey			2/10/2004				
Other	Level	Signature	Date	ANII Review		Signature	Date
					Nancy C. Ritchie Slaughter		3/2/04

Duke Energy

Supplemental Report

Report No.: UT-04-027

Page: 2 of 2

Summary No.: C05.021.054

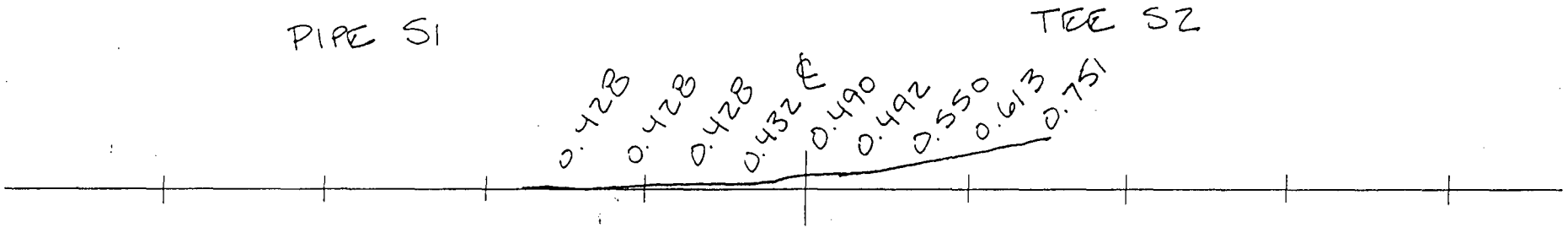
Examiner: Eaton, Jay A. Level: III Reviewer: Gary A Moss Date: 2-11-04

Examiner: Jordan, Joey Level: II Site Review: Date:

Other: Level: ANII Review: Nancy C Rutter Slaughter Date: 3/2/04

Comments:

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



Duke Energy.

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.054	Procedure Rev.:	15	Report No.:	UT-04-031
Workscope:	ISI	Work Order No.:	98606499	Page:	1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.54 Location: N/A

Drawing No.: 2-51A-17 (4) Description: Tee to Pipe

System ID: 51A

Component ID: C05.021.054 /2-51A-17-102 Size/Length: N/A Thickness/Diameter: 3.0" / .438

Limitations: Yes - See Attached Limitation Report Start Time: 0921 Finish Time: 0948

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

Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 01225

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27219 Surface Temp.: 97 °F

Cal. Report No.: CAL-04-033, CAL-04-044, CAL-04-047

Angle Used	0	45	45T	60	70	
Scanning dB			61	62	61	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ Initial Section XI Inspection

Percent Of Coverage Obtained > 90%: ~~Yes~~ No - 86.1% (initialed 3-10-04) Reviewed Previous Data: No

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Eaton, Jay A.	III	[signature]	2/10/2004	[signature] III		02/17/04
Examiner	**Level**	**Signature**	**Date**	**Site Review**	**Signature**	**Date**
Jordan, Joey	II	[signature]	2/10/2004			
Other	**Level**	**Signature**	**Date**	**ANII Review**	**Signature**	**Date**
N/A	N/A			Nancy C Ritchie Slaughter		3/2/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.054	Procedure Rev.:	15	Report No.:	UT-04-031
Workscope:	ISI	Work Order No.:	98606499	Page:	2 of 3

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	63.600	% Length X	100.000	% volume of length / 100 =	63.600	% total for Scan 1
Scan 2	63.600	% Length X	100.000	% volume of length / 100 =	63.600	% total for Scan 2
Scan ~~3~~ 1	36.400	% Length X	46.700	% volume of length / 100 =	16.999	% total for Scan 3
Scan ~~4~~ 2	36.400	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 4

2/10/04

Percent complete coverage

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

86.050 % Total for complete exam

Site Field Supervisor: [signature] III Date: 2/10/04

NOTE: 70° SHEAR SCAN NOT INCLUDED IN PERCENT COVERAGE BECAUSE OF THE REQUIREMENTS OF 10CFR50.55a.(b)(2)(xv)(A) BEST EFFORT SCAN WITH 70° SHEAR OBTAINED 53.3% COVERAGE IN ONE AXIAL DIRECTION.

Duke Energy

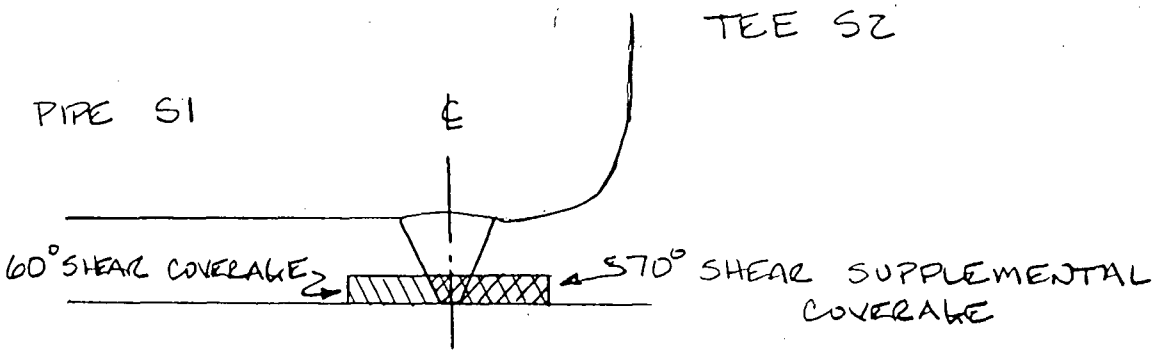
Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
mary No.:	C05.021.054	Procedure Rev.:	15	Report No.:	UT-04-031
Workscope:	ISI	Work Order No.:	98606499	Page:	3 of 3

Description of Limitation:

Limited in the throat on each side of the tee on the S2 side of the weld. Lo + 1.75" to Lo + 3.75" and Lo + 7.25" to Lo + 9.25".

Sketch of Limitation:



TOTAL EXAM AREA = .15 x 1.0 = .15 IN^2

60° SHEAR COVERAGE = $\frac{.4+.5}{2}$ x .15 = .07 / .15 x 100 = 46.7%

70° SHEAR COVERAGE = .15 - .07 = .08 / .15 x 100 = 53.3%

Limitations removal requirements:

N/A

Radiation field: N/A

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Eaton, Jay A.			2/10/2004	Dan Moss			2-11-04
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Jordan, Joey			2/10/2004				
Other	Level	Signature	Date	ANII Review		Signature	Date
				Nancy C Ritchie Slaughter			3/2/04

Duke Energy

UT Base Metal Lamination

Site/Unit: Oconee / 2 | Procedure: NDE-640 | Outage No.: ONS2EOC20
Summary No.: C05.021.056 | Procedure Rev.: 2 | Report No.: UT-04-021
Workscope: ISI | Work Order No.: 98606501 | Page: 1 of 2

Code: Asme Section XI 1989 | Cat./Item: C-F-1/C5.21.56 | Location: N/A
Drawing No.: 2HP-227 | Description: Elbow to Valve (2HP-114)
System ID: 51A
Component ID: C05.021.056 /2HP-227-11 | Size/Length: N/A | Thickness/Diameter: 3.0" / .438
Limitations: None | Start Time: 0911 | Finish Time: 0916

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND
Lo Location: 9.1.1.2 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 01225
Temp. Tool Mfg.: FISHER | Serial No.: MCNDE 27217 | Surface Temp.: 81 °F | Scanning dB: 40
Cal. Report No.: CAL-04-038

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ | Initial Section XI Inspection
Percent Of Coverage Obtained > 90%: Yes-100% | Reviewed Previous Data: No

Examiner Level III Houser, Gayle E.	Signature G E Houser	Date 2/10/2004	Reviewer Gary Moss	Signature	Date 2-11-04
Examiner Level II Weaver, Marion T.	Signature Marion T. Weaver	Date 2/10/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review	Signature	Date 2/27/04

Duke Energy

Supplemental Report

Report No.: UT-04-021

Page: 2 of 2

Summary No.: C05.021.056

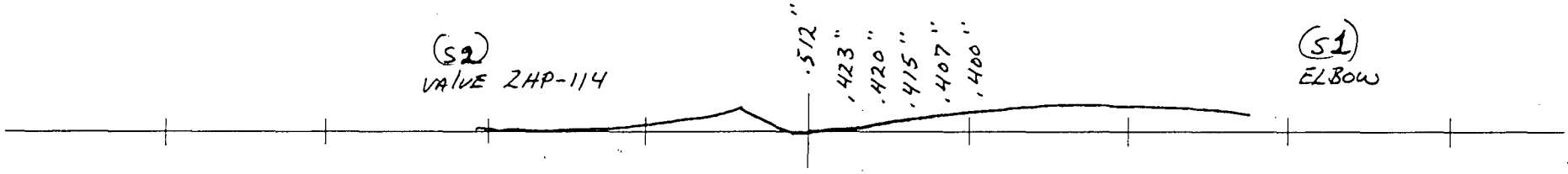
Examiner: Houser, Gayle E. — Level: III — Reviewer: Gary J. Moore — Date: 2-11-04

Examiner: Weaver, Marion T. — Level: II — Site Review: — Date:

Other: N/A — Level: N/A — ANII Review: — Date: 2/27/04

Comments:

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



Duke Energy

UT Pipe Weld Examination

Site/Unit: Oconee / 2 | Procedure: NDE-600 | Outage No.: ONS2EOC20
Summary No.: C05.021.056 | Procedure Rev.: 15 | Report No.: UT-04-023
Workscope: ISI | Work Order No.: 98606501 | Page: 1 of 3

Code: Asme Section XI 1989 | Cat./Item: C-F-1/C5.21.56 | Location: N/A
Drawing No.: 2HP-227 | Description: Elbow to Valve (2HP-114)
System ID: 51A
Component ID: C05.021.056 /2HP-227-11 | Size/Length: N/A | Thickness/Diameter: 0.438"/3"
Limitations: Yes - See attached limitation report | Start Time: 0916 | Finish Time: 0930

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND
Lo Location: 9.1.1.2 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 01225
Temp. Tool Mfg.: FISHER | Serial No.: MCNDE 27217 | Surface Temp.: 81 °F
Cal. Report No.: CAL-04-039, CAL-04-040, CAL-04-041

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

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

Results: Accept ☑ Reject ☐ Info ☐ | Initial Section XI Inspection
Percent Of Coverage Obtained > 90%: No - 35.7% | Reviewed Previous Data: No

Examiner Houser, Gayle E.	Level III	Signature H E Houser	Date 2/10/2004	Reviewer Gary J Moss		Signature	Date 2-11-04
Examiner Weaver, Marion T.	Level II	Signature Marion T. Weaver	Date 2/10/2004	Site Review		Signature	Date
Other	Level	Signature	Date	ANII Review		Signature	Date 2/27/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.056	Procedure Rev.:	15	Report No.:	UT-04-023
Workscope:	ISI	Work Order No.:	98606501	Page:	2 of 3

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	42.900	% volume of length / 100 =	42.900	% total for Scan 1
Scan 2	100.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

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

35.725 **% Total for complete exam**

Site Field Supervisor: [signature] III Date: 2/10/04

NOTE: 70° SHEAR SCAN NOT INCLUDED IN PERCENT COVERAGE BECAUSE OF THE REQUIREMENTS OF 10CFR50.55a(b)(2)(xv)(A)(2). BEST EFFORT SCAN WITH 70° SHEAR OBTAINED 57.1 % COVERAGE IN ONE AXIAL DIRECTION.

Duke Energy

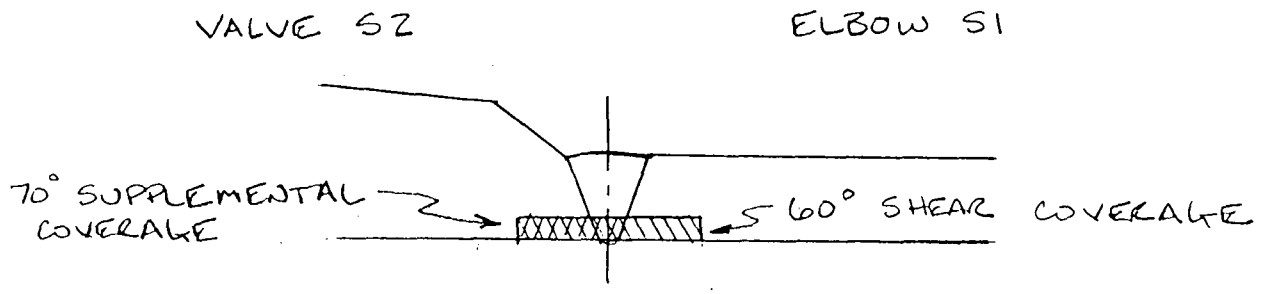
Limitation Record

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
ummary No.:	C05.021.056	Procedure Rev.:	15	Report No.:	UT-04-023
Workscope:	ISI	Work Order No.:	98606501	Page:	3 of 3

Description of Limitation:

Partial coverage from S1 CW & CCW - No scan S2 due to valve configuration.

Sketch of Limitation:



TOTAL EXAM AREA = .15 x .95 = .14 IN²

60° SHEAR COVERAGE = $\frac{0.35 + 0.4}{2}$ x .15 = .06/.14 x100 = 42.9%

70° SHEAR COVERAGE = .14 - .06 = .08/.14 x100 = 57.1%

45° CW & CCW COVERAGE = .14 ÷ 2 = .07/.14 x100 = 50%

Limitations removal requirements:

N/A

Radiation field: **N/A**

Examiner	Level III	Signature	Date	Reviewer		Signature	Date
Houser, Gayle E.			2/10/2004		III		2/10/04
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Weaver, Marion T.		Marion T. Weaver	2/10/2004				
Other	Level	Signature	Date	ANII Review		Signature	Date
							2/27/04

Duke Energy

UT Base Meta. Examination

Site/Unit: Oconee / 2 | Procedure: NDE-640 | Outage No.: ONS2EOC20
Summary No.: C05.021.058 | Procedure Rev.: 2 | Report No.: UT-04-104
Workscope: ISI | Work Order No.: 98604113 | Page: 1 of 2

Code: Asme Section XI 1989 | Cat./Item: C-F-1/C5.21.58 | Location: N/A
Drawing No.: 2-51A-31 | Description: Pipe to Valve (2HP-20)
System ID: 51A
Component ID: C05.021.058 /2-51A-31-50 | Size/Length: N/A | Thickness/Diameter: .438"/3.0"
Limitations: NONE | Start Time: 1103 | Finish Time: 1105

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: GROUND
Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 03125
Temp. Tool Mfg.: FISHER | Serial No.: MCNDE32769 | Surface Temp.: 63 °F | Scanning dB: 45
Cal. Report No.: CAL-04-186

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☑ Reject ☐ Info ☐ | Initial Section IX Inspection
Percent Of Coverage Obtained > 90%: Yes 100% | Reviewed Previous Data: No

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Resor, James H.		James H Resor	3/30/2004		Gary A Moss		4-2-04
Examiner	Level II	Signature	Date	Site Review		Signature	Date
Mauldin, Larry E.		Larry E Mauldin	3/30/2004				
Other	Level	Signature	Date	ANII Review		Signature	Date
					Nancy C Ritchie Slaughter		4/6/04

Duke Energy

Supplemental Report

Report No.: UT-04-104

Page: 2 of 2

Summary No.: C05.021.058

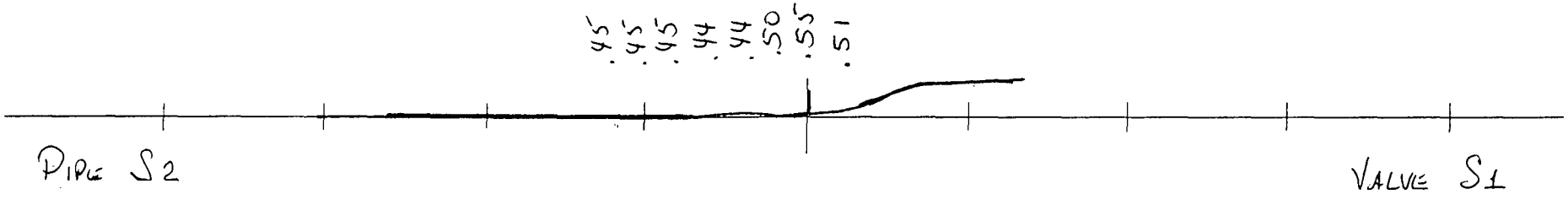
Examiner: Resor, James H. JHR Level: II Reviewer: Gary J Moss Date: 3-31-04

Examiner: Mauldin, Larry E. Larry E Mauldin Level: II Site Review: Date:

Other: Level: ANII Review: Nancy C Ratliff Slaughter Date: 4/6/04

Comments:

Sketch or Photo: Z:\UT\PERSONEL\JHR9576\PaintLine4.jpg



Duke Energy

UT Pipe Weld Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.058	Procedure Rev.:	15	Report No.:	UT-04-105
Workscope:	ISI	Work Order No.:	98604113	Page:	1 of 4

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.58 Location: N/A

Drawing No.: 2-51A-31 Description: Pipe to Valve (2HP-20)

System ID: 51A

Component ID: C05.021.058 /2-51A-31-50 Size/Length: N/A Thickness/Diameter: .438"/3.0"

Limitations: Yes - See attached sheets Start Time: 1114 Finish Time: 1131

Examination Surface: Inside ☐ Outside ☑ Surface Condition: GROUND

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

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32769 Surface Temp.: 63 °F

Cal. Report No.: CAL-04-187, CAL-04-188, CAL-04-189

Angle Used	0	45	45T	60	70	
Scanning dB			43	45	47	

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

Comments:

*See attached limitation sheets

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner Resor, James H.	Level II	Signature	Date 3/30/2004	Reviewer		Signature	Date 4-2-04
Examiner Mauldin, Larry E.	Level II	Signature	Date 3/30/2004	Site Review		Signature	Date
Other	Level	Signature	Date	ANII Review		Signature	Date 4/6/04

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2-51A-31-50 **Item No:** C05.021.058

remarks: DUE TO VALVE CONFIGURATION

[X] NO SCAN	SURFACE	BEAM DIRECTION	
[ ] LIMITED SCAN	[X] 1 [ ] 2	[ ] 1 [X] 2 [ ] cw [ ] ccw	
FROM L N/A to L N/A		INCHES FROM W0 ℄ to BEYOND	
ANGLE: [ ] 0 [ ] 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	Level: II	Date: 3-30-04	Sheet 2 of 4
Reviewed By: Gary A Moss	Date:	Authorized Inspector: Nancy C. Ritchie Slaughter	Date: 4/6/04

Duke Energy

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	Oconee / 2	Procedure:	NDE-600	Outage No.:	ONS2EOC20
Summary No.:	C05.021.058	Procedure Rev.:	15	Report No.:	UT-04-105
Workscope:	ISI	Work Order No.:	98604113	Page:	3 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	0.000	% volume of length / 100 =	0.000	% total for Scan 1
Scan 2	100.000	% Length X	36.000	% volume of length / 100 =	36.000	% 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;

59.000 **% Total for complete exam**

Site Field Supervisor: David K [illegible] Date: 4/5/04

NOTE: 70° SHEAR WAVE SCAN NOT INCLUDED IN PERCENT of COVERAGE BECAUSE of THE REQUIREMENTS of 10 CFR 50.55a(b)(2)(xv)(A)(2). REST EFFORT SCAN WITH 70° SHEAR WAVE TO OBTAIN 59% COVERAGE IN ONE AXIAL DIRECTION.

Duke Energy.

Supplemental Report

Report No.: _____

Page: ____ of ____

Summary No.: C05.021.058

Examiner: LARRY E. MAULDIN Larry E Mauldin Level: II Reviewer: David K B Date: 4/5/04

Examiner: _____ Level: ____ Site Review: _____ Date: ____

Other: _____ Level: ____ ANII Review: Nancy C Ritchie Slaughter Date: 4/6/04

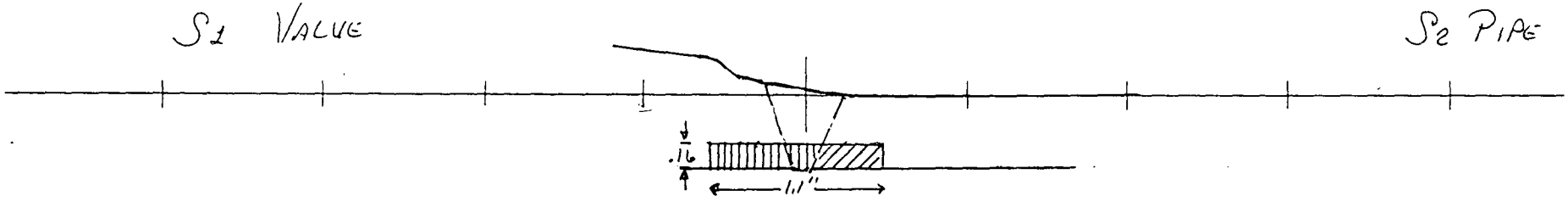
Comments:

TOTAL AREA 1.1" X .16" = .176 = .18 SQ.IN.

60% COVERAGE $\frac{.16}{2}(.38+.43) = .0648 = .0648^2/IN \div .18 SQ.IN = 36\%$

Sketch or Photo:

70% SUPPLEMENTAL COVERAGE $\frac{.16}{2}(.72+.67) = .1112 \div .18 SQ.IN = 61.78\%$



▨ - 60° SHEAR WAVE COVERAGE

▥ - 70° SHEAR WAVE SUPPLEMENTAL COVERAGE

NOTE: SUPPLEMENTAL COVERAGE IS NOT USED IN COVERAGE CALCULATIONS.