



H. B. Barron  
Vice President

**Duke Energy Corporation**

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April 11, 2001

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

Subject: McGuire Nuclear Station, Unit 2  
Docket No. 50-370  
Relief Request 01-001

Pursuant to 10CFR50.55a(g)(5)(iii), Duke Energy Corporation requests relief from certain ASME Section XI Code requirements as described in the attached Relief Request No. 01-001.

This relief request addresses cases of limited examination coverage from inspections performed during end of fuel cycle (EOC) 13 for Unit 2. This request is applicable to the Second 10-year Interval Inservice Inspection Program Plan. The 1989 Edition of the ASME Section XI Code contains the applicable requirements.

The enclosed relief request describes for each specified case that the ASME Code requirement is impractical. Each specific instance is described in detail, including a basis for why a reasonable assurance of structural integrity exists.

There are no identified commitments associated with this relief request. Although, submittal of Relief Request No. 01-001 satisfies a previous identified commitment.<sup>1</sup>

Please direct questions regarding this request to M. R. Wilder at (704) 875-5362.

Sincerely,

H. B. Barron

Enclosure

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<sup>1</sup> Letter, H. B. Barron to NRC, Dated January 11, 2001, Inservice Inspection Report

A047

U.S. Nuclear Regulatory Commission  
April 11, 2001  
Page 2 of 2

xc w/enclosure:

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Atlanta Federal Center  
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S. M. Shaeffer  
Senior NRC Resident Inspector  
McGuire Nuclear Station

bxc w/o encl: R.K. Rhyne  
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R.D. Klein (MG01MM)

bxc w/ encl: RCG Files  
Master File # 1.3.2.13  
NRIA File/ELL

**ENCLOSURE**

**RELIEF REQUEST NO. 01-001**

Duke Energy Corporation

McGuire Nuclear Station - Unit 2

SECOND 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 01-001  
Duke Energy Corporation has determined that conformance with certain ASME Section XI Code requirements is impractical. Therefore, pursuant to 10CFR50.55a (g) (5) (iii), Duke Energy requests relief from applicable portions of the code.

I. System / Components(s) for Which Relief is Requested:

Examination Category B-J:

Piping Circumferential Welds for Reactor Coolant and Safety Injection systems

<u>ID Numbers</u>	<u>Item Numbers</u>	<u>End of Cycle</u>
2NC2FW53-25	B09.011.032	13
2NC2FW53-37	B09.011.039	13
2NI2F471	B09.011.162	13
2NI2F494	B09.011.165	13

Examination Category C-B:

Nozzle-to-Shell (or Head) Weld for Steam Generator 2C  
Auxilliary Feedwater Nozzle to Shell

<u>ID Numbers</u>	<u>Item Numbers</u>	<u>End of Cycle</u>
2SGC-W259	C02.021.007	13

Examination Category C-F-1:

Piping Circumferential Weld for Safety Injection System

<u>ID Numbers</u>	<u>Item Numbers</u>	<u>End Of Cycle</u>
2NI2F493	C05.011.129	13

Piping Circumferential Weld for Chemical and Volume Control System

<u>ID Numbers</u>	<u>Item Numbers</u>	<u>End Of Cycle</u>
2RCPA-TE	C05.021.081	13

**II. Code Requirement:**

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWB-2500, lists the following requirements for each Examination Category as shown below:

**Examination Category B-J:** Figure IWB-2500-8.

**NOTE 1:**

10 CFR 50.55a(b) (2) (xv) (A) states: "When applying Supplements 2 and 3 to Appendix VIII, the following examination coverage criteria requirements must be used:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaws on the opposite side of the weld."

10 CFR 50.55a(b) (2) (xvi) (B) states: "Examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single sided examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and 50.55a(b) (2) (xv) (A) ."

**Examination Category C-B:** Figure IWC-2500-4 (a) .

ASME Section V, Article 4, Paragraph T-424.1 states: "The volume shall be examined by moving the search unit over the examination surface so as to scan the entire examination volume."

**Examination Category C-F-1:** Figure IWC-2500-7 requires 100% of examination volume.

Reference: Note 1 (Page 2)

**III. Code Requirement from Which Relief Is Requested:**

**Examination Category B-J:**

Relief is being sought from the requirement to perform examinations of stainless steel welds from one side using equipment, procedures, and personnel that have demonstrated proficiency with single sided examinations demonstrated to the requirements of Appendix VIII as modified by this paragraph and 50.55a(b) (2) (xv) (A) .

<u>Item Numbers</u>	<u>Actual Coverage Obtained</u>
B09.011.032	60.30%
B09.011.039	60.30%
B09.011.162	59.70%
B09.011.165	59.61%

**Examination Category C-B:**

Relief is being sought from the requirement to scan the entire examination volume.

<u>Item Numbers</u>	<u>Actual Coverage Obtained</u>
C02.021.007	74.40%

**Examination Category C-F-1:**

Relief is being sought from the requirement to perform examinations of stainless steel welds from one side using equipment, procedures, and personnel that have demonstrated proficiency with single sided examinations demonstrated to the requirements of Appendix VIII as modified by this paragraph and 50.55a(b) (2) (xv) (A) .

<u>Item Numbers</u>	<u>Actual Coverage Obtained</u>
C05.011.129	59.86%
C05.021.081	58.17%

**IV. Basis for Relief:**

**Examination Category B-J:**

During the ultrasonic examination of Weld Numbers 2NC2FW53-25 (B09.011.032) and 2NC2FW53-37 (B09.011.039) coverage of the required examination volume could not be obtained. The examination coverage was limited to 60.30%. These are stainless steel pipe to flange welds where access is limited to the pipe side only. See Attachment 1

During the ultrasonic examination of Weld Numbers 2NI2F471 (B09.011.162) and 2NI2F494 (B09.011.165) coverage of the required examination volume could not be obtained. The examination coverage was limited to 59.70% and 59.61%. These are stainless steel pipe to valve welds where access is limited to the pipe side only. See Attachment 1

In the case of the above listed piping welds, austenitic weld metal characteristics and single sided access caused by the component geometry prevents two sided coverage of the examination volume. The welded component configuration would have to be re-designed to allow scanning from both sides of the weld over the required examination volume.

**Examination Category C-B:**

During the ultrasonic examination of the Steam Generator 2C Auxiliary Feedwater Nozzle to Shell Weld 2SGC-W259 (C02.021.007) coverage of the required examination volume could not be obtained. The examination coverage was limited to 74.40% of the required volume from one side. This is a ferritic nozzle to shell weld where access is limited to the vessel shell side only. The welded component configuration would have to be re-designed to allow scanning from both sides of the weld over the required examination volume. See Attachment 2.



**Examination Category C-F-1:**

During the ultrasonic examination of the Safety Injection System Circumferential Weld 2NI2F493 (C05.011.129) coverage of the required examination volume could not be obtained. The examination coverage was limited to 59.86%. This is a stainless steel pipe to valve weld where access is limited to the pipe side only. See Attachment 3.

During the ultrasonic examination of the Chemical and Volume Control System Circumferential Weld 2RCPA-TE (C05.021.081) coverage of the required examination volume could not be obtained. The examination coverage was limited to 58.17%. This is a stainless valve to tee weld where access is limited to one side only. See Attachment 3.

In the case of the above listed piping welds, austenitic weld metal characteristics and single sided access caused by the component geometry prevents two sided coverage of the examination volume. The welded component configuration would have to be re-designed to allow scanning from both sides of the weld over the required examination volume.

**V. Alternate Examinations or Testing:**

Radiography of the welds referenced in this relief request is impractical due to component design and insufficient access for placement of film and number belts. Since radiography is an impractical alternative for these welds, Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical for the Item Numbers referenced in this Request for Relief. No additional ultrasonic examinations are planned during the current interval for the welds referenced in this request.

**VI. Justification for the Granting of Relief:****Examination Category B-J:**

Ultrasonic examination of the Category B-J piping welds was conducted using personnel, equipment and procedures qualified through the Performance Demonstration Initiative (PDI) Program. Current ultrasonic technology is not capable of consistently detecting and sizing flaws on the far side of an austenitic weld for configurations common to U.S. nuclear applications. To demonstrate that the best available technology was applied, PDI provides a best effort qualification instead of a complete single side demonstration. PDI Performance Demonstration Qualification Summary (PDQS) for austenitic piping shows that single sided examination is performed as a best effort. Therefore, the far side of the austenitic weld, which can only be accessed from one side, will be listed as an area of no coverage.

Items B09.011.032 and B09.011.039 welds are located within the reactor coolant loop. These welds are not exposed to significant neutron fluence and are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. These welds were rigorously inspected by radiography and dye penetrant during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at any of the welds in question, the reactor coolant leakage calculation which is normally performed daily (and required by Technical Specifications to be performed every 72 hours) would provide an early indication of leakage. The unidentified leakage specification in Technical Specification 3.4.13.1 is 1 gpm. Several other indicators such as containment radiation monitors EMF-38, -39, and -40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

Items B09.011.162 and B09.011.165 welds are located within the Emergency Core Cooling System Cold Leg

Injection lines. These welds are not exposed to significant neutron fluence and are not prone to embrittlement associated with neutron bombardment. These welds were rigorously inspected by radiography and dye penetrant during construction and verified to be free from unacceptable fabrication defects. A leak at either of these welds could be detected by the means described in the preceding paragraph. Check valves located downstream could however provide isolation from the reactor coolant system. In that case leakage from these welds would be indicated by outleakage from the associated Cold Leg Accumulator tanks. Level in these tanks is continuously monitored and alarmed in the control room and is maintained within limits established in Technical Specification 3.5.1.2. The fill frequency for these tanks is also trended by the Safety Injection System Engineer who would notice an increase in makeup's to the tank should leakage occur from either of these welds. Also containment floor and equipment sump level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

**Examination Category C-B:**

Ultrasonic examination of the Category C-B Steam Generator Nozzle to Shell Weld Item Number C02.021.007 was conducted using personnel, equipment and procedures qualified through the PDI Program for ferritic pressure vessel welds. The qualifications were conducted on samples with access to both sides of the weld. Therefore, Duke Energy Corporation does not claim credit for a single sided examination.

If a leak were to occur at the weld in question [Steam Generator (CA) Nozzle], there are methods by which the leak could be identified for prompt Engineering evaluation. A leak at a CA nozzle would result in the following:

a) Increased containment humidity. This parameter is indicated in the control room and is monitored periodically by Operations and also the Containment Ventilation System Engineer.

b) Increased S/G enclosure temperature. This parameter is continuously monitored by the Operations via an OAC alarm, and is periodically monitored by the System Engineer.

c) Increased input into the Ventilation Unit Condensate Drain Tank (VUCDT). This parameter is monitored continuously by Operations via an OAC alarm and also periodically by the Liquid Radwaste System Engineer and Reactor Coolant System Engineer.

Note: The above parameters would be used to identify a leak in the steam generator enclosure, but could not specifically identify the CA nozzle as the source of leakage. A containment entry would be required to identify the exact source of the leakage.

Also, a containment walkdown is performed when the unit reaches Mode 3 (full temperature / pressure) during the unit shutdown for each refueling outage. This walkdown should identify any leak at the weld in question.

Concerning the consequences of a leak at the CA nozzle (affects on CA system operation): Any leakage would result in a portion of the CA flow bypassing the steam generator, and therefore being unavailable to maintain steam generator levels. Very small leaks (< 1 gpm) would have no discernible effect on CA system operation. Leaks that approach 5 gpm would need to be evaluated for system operability effects. McGuire has specific Safety Analysis for accidents where minor and major main feedwater system pipe breaks are postulated. These Safety Analyses demonstrate compliance with requirements of 10CFR100. Replacement or re-design of any of these Class 1 or Class 2 nozzles is not a viable alternative. Duke Energy believes the amount of coverage obtained for these examinations provides reasonable assurance of the continued structural integrity of the subject welds.

Also the CA nozzles are equipped with thermal sleeves to limit thermal shock due to auxiliary feedwater injections. McGuire operates the CA nozzles consistent

with the stress and fatigue qualifications provided by the Manufacturer (BWI).

**Examination Category C-F-1:**

Ultrasonic examination of the Category C-F-1 piping welds was conducted using personnel, equipment and procedures qualified through the PDI Program. Current ultrasonic technology is not capable of consistently detecting and sizing flaws on the far side of an austenitic weld for configurations common to U.S. nuclear applications. To demonstrate that the best available technology was applied, PDI provides a best effort qualification instead of a complete single side demonstration. PDI Performance Demonstration Qualification Summary (PDQS) for austenitic piping shows that single sided examination is performed as a best effort. Therefore, the far side of the austenitic weld, which can only be accessed from one side, will be listed as an area of no coverage.

Item C05.011.129 above is located on the "D" Cold Leg ECCS line. This weld is not exposed to significant neutron fluence and is not prone to embrittlement associated with neutron bombardment. This weld was rigorously inspected by radiography and dye penetrant during construction and verified to be free from unacceptable fabrication defects. Because there are two check valves between this weld and the reactor coolant loop, it is not likely that leakage through this weld would be exhibited as described above for the Category B-J piping. Likewise a single check valve may also prevent outleakage from the "D" Cold Leg Accumulator (as described above for Items B09.011.162 and B09.011.165 welds) from indicating weld leakage. Leakage from this weld would likely be indicated by the containment floor and equipment sump level which is alarmed in the control room. The inputs to this sump are also trended by the WL Liquid Radwaste system engineer and an upward trend or significant influent increase would prompt Operations and Engineering evaluation.

Item C05.021 is located on a portion of the Chemical and Volume Control system which is not credited nor is it required for accident mitigation. A leak from this

weld would not be considered an accident initiator. This weld is located on the discharge accumulator for the Reciprocating Charging Pump. Although this pump is not normally in operation, it is operated on a quarterly frequency at which time an operator is dispatched to observe the pump and would likely notice any leakage from the weld. Since the pressure during the quarterly pump run is ten times more than ND discharge pressure (accident condition), a leak in the weld is more likely to occur during pump operation. At other times, leakage from this weld would be noticed during operator rounds which are conducted in the pump room once each shift. NC unidentified leakage would also readily detect leakage from this piping. A leak from this weld could easily be isolated leaving the Emergency Core Cooling System 100% functional.

#### **VII. Implementation Schedule:**

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the Item Numbers referenced in Section I of this Request for Relief. No additional ultrasonic examinations are planned during the current interval for the welds referenced in Section I of this request.

These examinations will continue to be scheduled in accordance with the requirements of ASME Section XI for future inspection intervals.

#### **VIII. References:**

Attachment 1. Drawings of Examination Category B-J affected welds/examination areas, and details including calculation methods for:

B09.011.032

B09.011.039

B09.011.162

B09.011.165

Attachment 2. Drawings of Examination Category C-B affected weld, and details including calculation methods for:

C02.021.007

Attachment 3. Drawings of Examination Category C-F-1 affected welds, and details including calculation methods for:

C05.011.129

C05.021.081

The following individuals were involved in the development of this request for relief. Edward Hyland, Bob Kirk, Bryan Meyer, Grant Cutri (McGuire Primary Systems Engineering) and Hoang V. Dinh (McGuire Civil Engineering) provided input to the engineering justification (Section VI) for granting relief. Jim McArdle (NDE Level III) provided Sections II, III, IV and V. Gary Underwood (McGuire ISI Plan Manager) compiled and completed the request.

Sponsored By: Gary Underwood Date 3/28/01

Approved By: R. Kevin Rhyme Date 3/28/01

# McGuire Unit #2 EOC13

Item # B09.011.032  
Weld # 2NC2FW 53-25

No Data Recorded. Reference Calibration Sheet #'s

000 20 48  
000 20 50  
                      
                      
                    

1 of 4



# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2NC2FW53-25

Item No: B09.011.032

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☒ 1   ☐ 2      ☐ 1   ☒ 2   ☐ cw   ☐ ccw  
 FROM L      N/A      to L      N/A      INCHES FROM WO      .6"      to      BEYOND       
 ANGLE: ☐ 0   ☐ 45   ☒ 60   ☐ Other      FROM      0      DEG to      360      DEG

DUE TO FLANGE CONFIGURATION

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

Prepared By: *James H. Bess*

Level: II

Date: 9-20-00

Sketch(s) attached ☒ yes   ☐ no

Sheet 2 of 4

Reviewed By: *Larry L. Bell*

Date: 9-25-00

Authorized Inspector: *[Signature]*

Date: 9-26-00

R  
34  
1013

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>	NDE-91-1
	Revision 0

Examination Volume/Area Defined	
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius	
Area Calculation	Volume Calculation
.24 X 1.3 = .312 SQ. IN.	.312 X 21.0 = 6.6 CU. IN

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45	CW	.312	21	6.6	6.6	100.00
2	45	CCW	.312	21	6.6	6.6	100.00
3	60	S2	.127	21	2.7	6.6	40.91
4	60	S1	0	0	0	6.6	0.00
		SHEAR WAVE	AGGREGATE	COVERAGE			
L-WAVE							60.30
4	60L	S1	.185	21	3.9	6.6	0.00
							59.09

59.1% OF 25% (SCAN 4) = 14.8%

*[Handwritten signature/initials]*

		Item No:	B09.011.032
Prepared By:	<i>Jenna H. Besser</i>	Level:	<i>II</i> Date: <i>9-20-00</i>
Reviewed By:	<i>Larry L. Bibb</i>	Level:	<i>III</i> Date: <i>9-25-00</i>

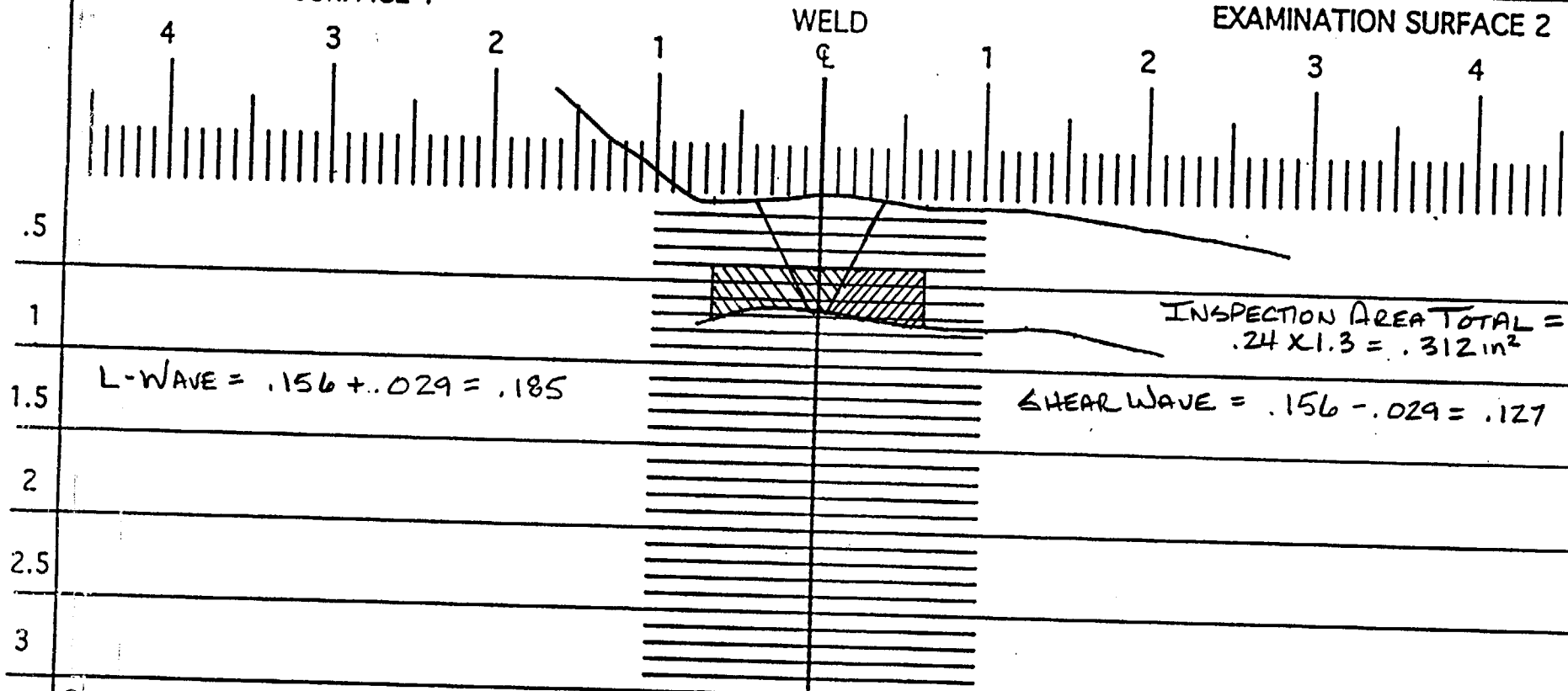
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 2NC2FW53-25

Remarks:

Item No: B09.011.032

Examiner: *James H. Breen*

Level: II

Date: 9-20-00

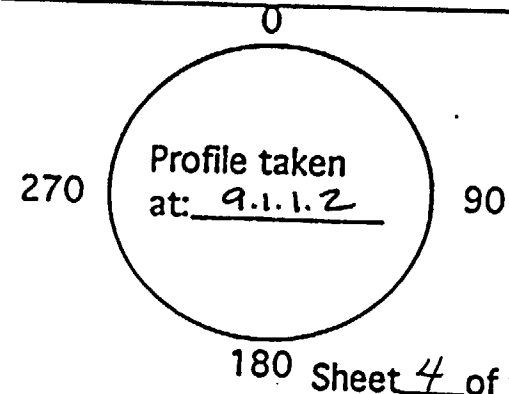
Reviewed By: *Greg S. Ball*

Level: III

Date: 9-25-00

Authorized Inspector: *[Signature]*

Date: 9-26-00



180 Sheet 4 of 4

R  
G  
10/3/00

# McGuire Unit #2

## EOC13

Item # B09.011.039  
Weld # 2NC 2FW 53-37

No Data Recorded. Reference Calibration Sheet #'s

000 20 48  
000 20 50  
                      
                      
                      
                    

10f4

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# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2NC2FW53-37

Item No: B09.011.039

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☒ 1   ☐ 2      ☐ 1   ☒ 2   ☐ cw   ☐ ccw  
 FROM L   N/A   to L   N/A   INCHES FROM WO   .6"   to   BEYOND    
 ANGLE: ☐ 0   ☐ 45   ☒ 60   ☐ Other      FROM   0   DEG to   360   DEG

DUE TO FLANGE CONFIGURATION

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

Prepared By: James H. Bason

Level: II

Date: 9-20-00

Sketch(s) attached ☒ yes   ☐ no

Sheet 2 of 4

Reviewed By: Doug L. Bell

Date: 9-25-00

Authorized Inspector: [Signature]

Date: 9-26-00

B  
60  
10-4

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

☒ Base Metal      ☒ Weld      ☐ Near Surface      ☐ Bolting      ☐ Inner Radius

**Area Calculation**

.24 X 1.3 = .312 SQ. IN.

**Volume Calculation**

.312 X 21.0 = 6.6 CU. IN

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45	CW	.312	21	6.6	6.6	100.00
2	45	CCW	.312	21	6.6	6.6	100.00
3	60	S2	.127	21	2.7	6.6	40.91
4	60	S1	0	0	0	6.6	0.00
		SHEAR WAVE	AGGREGATE	COVERAGE			
L-WAVE	60L	S1	.185	21	3.9	6.6	60.30
							59.09

59.1% OF 25% (SCAN 4) = 14.8%

*R/*  
*10/2/02*

Item No: B09.011.039	
Prepared By: <i>Jennett H. Boser</i>	Level: <i>II</i> Date: <i>9-20-00</i>
Reviewed By: <i>Greg S. Bell</i>	Level: <i>III</i> Date: <i>9-25-02</i>

*R/*  
*10/2/02*

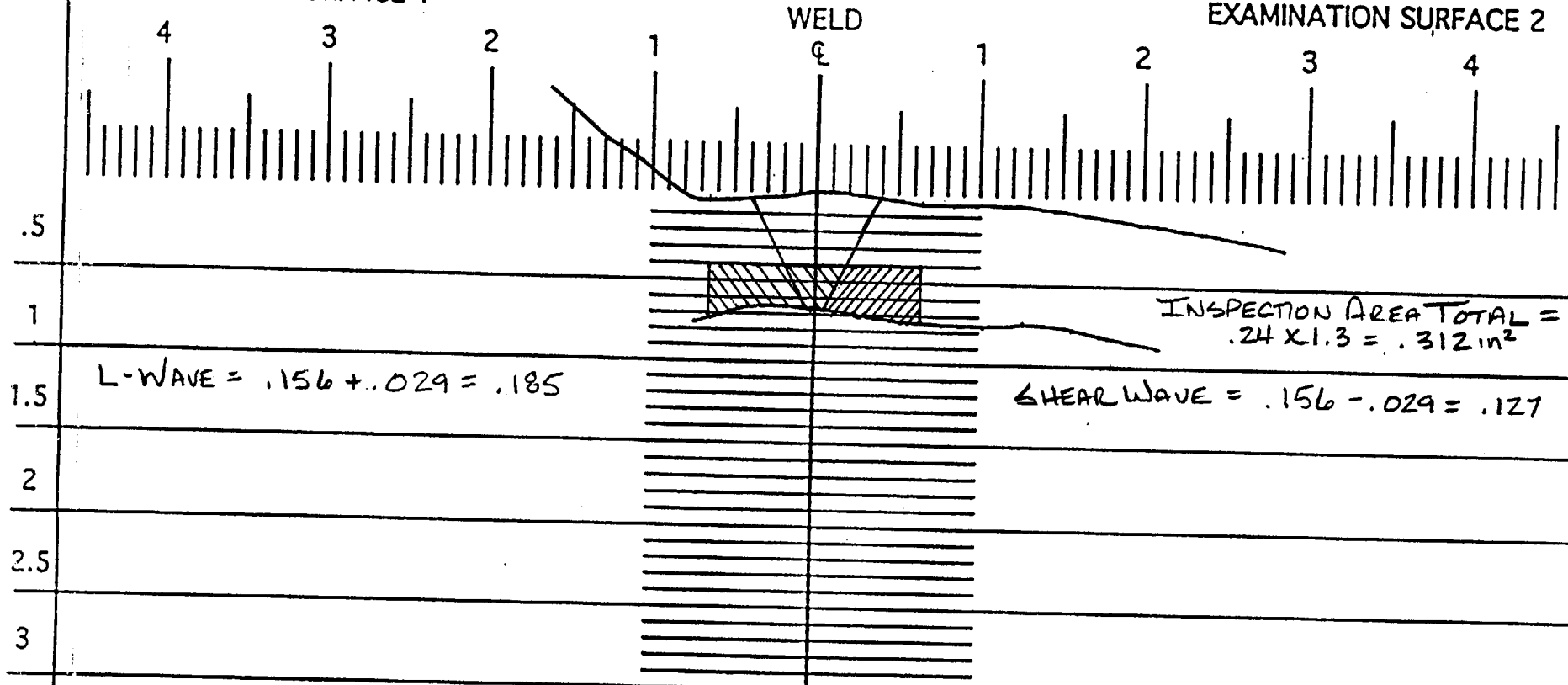
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 2NC2FW53-37

Remarks:

Examiner: *James H. Beeson*

Reviewed By: *Greg L. Bille*

Authorized Inspector: *[Signature]*

Item No: B09.011.039

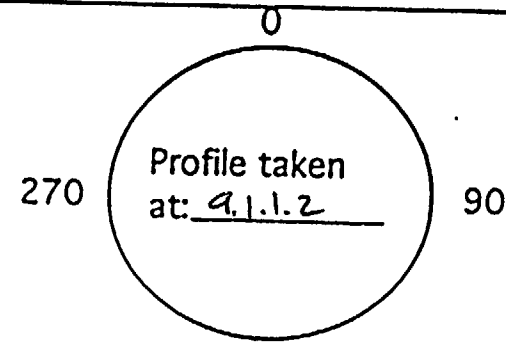
Level: II

Date: 9-20-00

Level: III

Date: 9-25-00

Date: 9-26-00



180 Sheet 4 of 4

*R. G. 10/4/00*

# McGuire Unit #2

## EOC13

Item # B09. 011. 162  
Weld # 2 N12F 471

No Data Recorded. Reference Calibration Sheet #'s

000 2029  
000 2030



# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2NI2F471

Item No: B09.011.162

Remarks:

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

DUE TO VALVE CONFIGURATION

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

Prepared By: Larry Mauldin

Level: III

Date: 9-12-00

Sketch(s) attached ☒ yes ☐ no

Sheet 2 of 4

Reviewed By: Larry L. Bibb

Date: III 9-15-00

Authorized Inspector: [Signature]

Date: 9-16-00

R  
G  
10/4/02

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>	NDE-91-1
	Revision 0

Examination Volume/Area Defined	
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius	
Area Calculation	Volume Calculation
.26" X 1.1" = .286 SQ. IN.	.286 SQ. IN. X 21" = 6.006 = 6.01 CU. IN.

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60S	2	.111	21	2.331	6.01	38.79
2	60S	1	0	21	0	6.01	0.00
3	45	CW	.286	21	6.01	6.01	100.00
4	45	CCW	.286	21	6.01	6.01	100.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	14.351	24.04	59.70
1	60L	2	.175	21	3.675	6.01	61.15

61.15% OF 25% (SCAN 1) =  
 LONG WAVE COVERAGE = 15.29% OF TOTAL WELD.

*Handwritten:* R, 10/14/00, 9/15/00

Item No: B09.011.162	
Prepared By: <i>Larry Mauldin</i>	Level: <i>III</i> Date: <i>9-12-00</i>
Reviewed By: <i>Larry L. Bilt</i>	Level: <i>III</i> Date: <i>9-15-00</i>

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

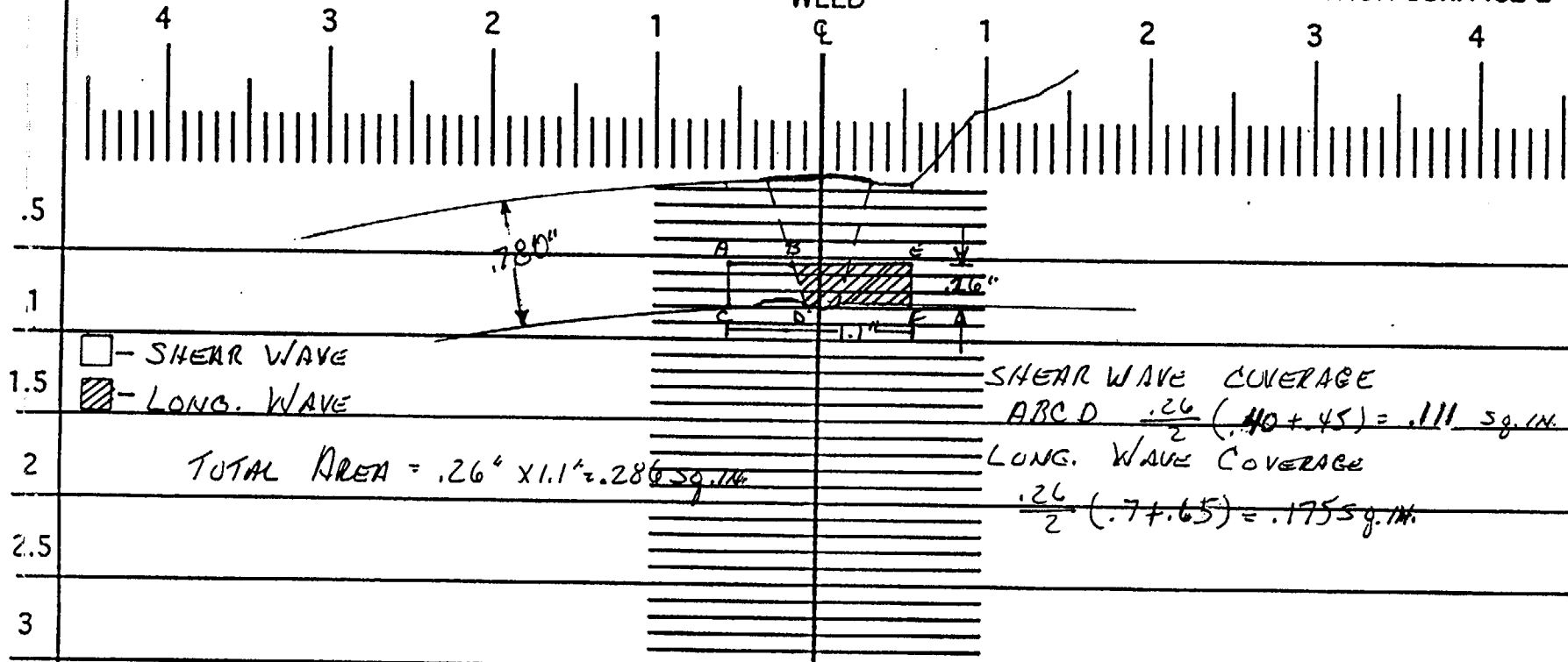
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No.

2 NI 2 F 471

Remarks:

Examiner:

Larry Mauldin

Item No:

809.011.162

Level:

II

Date: 9-12-00

Reviewed By:

Ray L. Bitt

Level:

III

Date: 9-15-00

Authorized Inspector:

Ray L. Bitt

Date: 9-16-00

270

Profile taken  
at: 180°

90

180 Sheet 4 of 4

R  
G  
10/1/00

# McGuire Unit #2

## EOC13

Item # B09.011.165  
Weld # 2N12F494

No Data Recorded. Reference Calibration Sheet #'s

000 20 27  
000 20 28  
                      
                      
                    

1 of 4

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

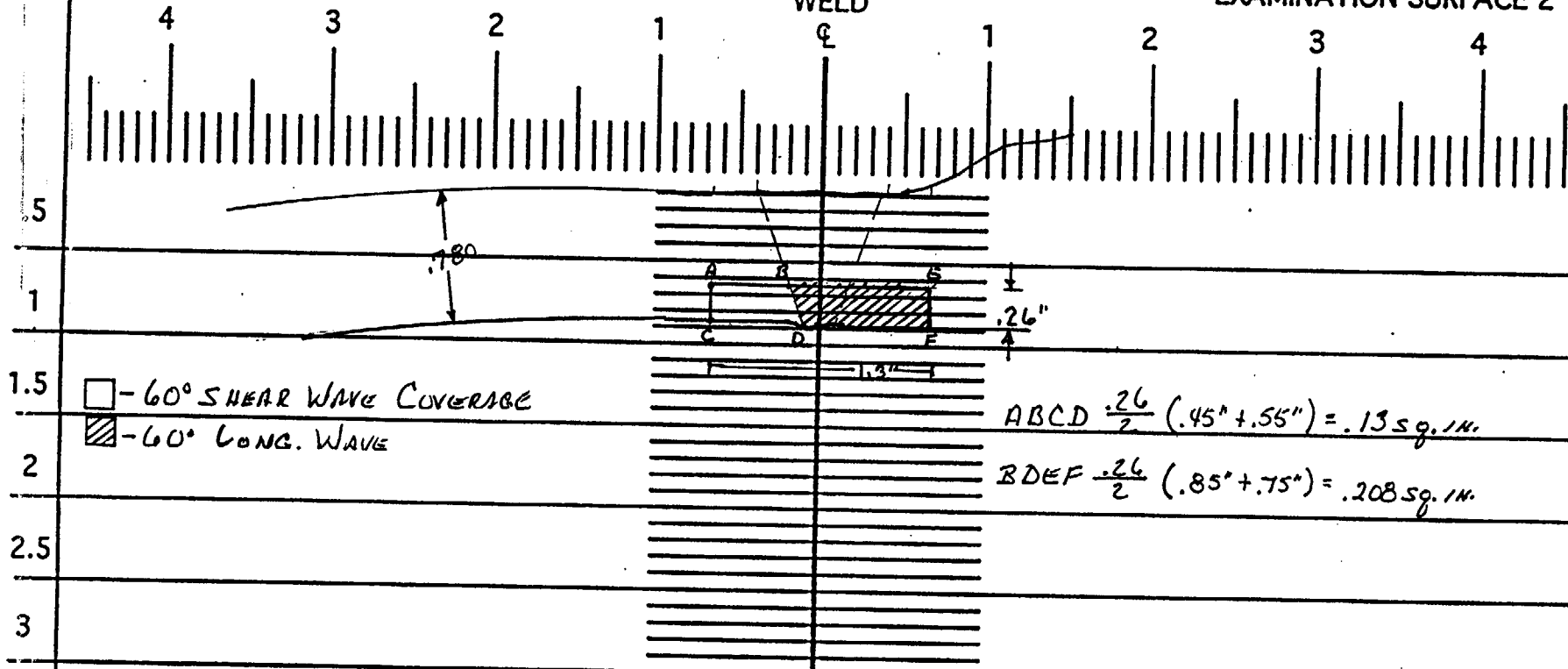
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2

WELD



Component ID/Weld No. 2 NI 2 F 494

Remarks:

Examiner:

*Larry Mauldin*

Item No: 309.011.165

Level: III

Date: 9-12-00

Reviewed By:

*Shy L. Bell*

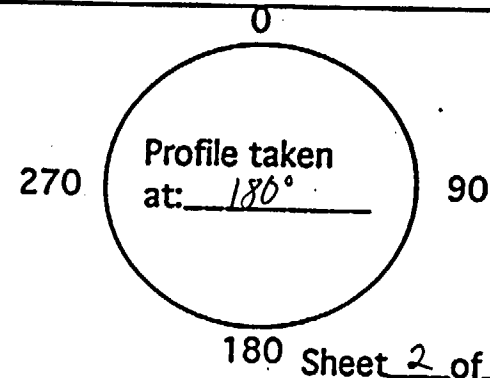
Level: III

Date: 9-15-00

Authorized Inspector:

*[Signature]*

Date: 9-16-00



180 Sheet 2 of 4

*R*  
*10/4/00*

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>	NDE-91-1
	Revision 0

Examination Volume/Area Defined				
<input checked="" type="checkbox"/> Base Metal	<input checked="" type="checkbox"/> Weld	<input type="checkbox"/> Near Surface	<input type="checkbox"/> Bolting	<input type="checkbox"/> Inner Radius

Area Calculation	Volume Calculation
.26 " X 1.3" = .338 SQ. IN.	.338 SQ. IN. X 21" = 7.098 = 7.1 CU. IN.

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60	2	.13	21	2.73	7.1	38.45
2	60	1	0	21	0	7.1	0.00
3	45	CW	.338	21	7.1	7.1	100.00
4	45	CCW	.338	21	7.1	7.1	100.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	16.93	28.4	59.61
1	60L	2	.208	21	4.368	7.1	61.52

LONG WAVE 61.5% OF 25% (SCAN 1) =  
15.25% OF TOTAL WELD

Item No: B09.011.165	
Prepared By: <i>Larry Mauldin</i>	Level: <i>III</i> Date: <i>9-12-00</i>
Reviewed By: <i>Larry H. Bibb</i>	Level: <i>IV</i> Date: <i>9-15-00</i>

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2N12F494

Item No: B09.011.165

Remarks:

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

DUE TO VALVE CONFIGURATION

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

Prepared By: Larry Mauldin      Level: III      Date: 9-12-00      Sketch(s) attached ☒ yes ☐ no      Sheet 4 of 4

Reviewed By: Shy L. Babb      Date: 9-15-00      Authorized Inspector: [Signature]      Date: 9-16-00

R  
G  
10/41

# DUKE POWER COMPANY

## ULTRASONIC DATA SHEET FOR PLANAR REFLECTORS IN FERRITIC PRESSURE VESSELS

Station: <u>MCGUIRE</u>	Unit: <u>Z</u>	Component/Weld ID: <u>ZSLC-W259</u>	Date: <u>9/23/00</u>
Weld Length (in.): <u>66"</u>	Surface Condition: <u>GROUND</u>	<u>L</u> <u>9.2.3</u>	Exam Start: <u>0940</u> Exam Finish: <u>1010</u>

Procedure No: <u>NDE-620</u>  Revision: <u>8</u>  FC <u>2/A</u>	Scans 70° <u>67.7</u> dB Zone I    60° <u>75.2</u> dB Zone II  60° <u>75.2</u> dB Zone III Axial  60° <u>75.2</u> dB Zone III Circ.	Configuration <u>S2</u> <u>S1</u> <u>NOZZLE TO SHELL</u>  Scan Surface: OD	Surface Temp. <u>109 ° F</u>  Pyrometer s/n: <u>MCWDE213</u>  Cal. Due Date: <u>11/18/00</u>	Calibration Sheet No: <u>0002054</u> <u>0002055</u> <u>0002056</u>
--	--	--	--	---

Indication #	$\angle$	MP <sub>max</sub>	% FSH	L <sub>max</sub>	W <sub>max</sub>	SU LOCATION	BEAM DIRECTION	SCAN	REMARKS
<u>NPI</u>	<u>70°</u>								<u>ZONE 1</u>
<u>NPI</u>	<u>60°</u>								<u>ZONE 2 &amp; 3</u>

> 90% Coverage obtained:    yes ☐    no ☒ (see NDE-UT-4) Limitation report is required

Examiner: [Signature] Level: II Date: 9/23/00 Examiner: \_\_\_\_\_ Level: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: [Signature] Level: III Date: 9-25-00 Authorized Inspector: [Signature] Date: 9-26-00

Item No: C02.021.007

R  
G  
10/9/00



# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2SGC-W259

Item No: C02.021.007

Remarks:


☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☒ 2      ☒ 1 ☒ 2 ☒ cw ☒ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ CL + 2" \_\_\_\_\_ to \_\_\_\_\_ BEYOND \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other 70 FROM 0 DEG to 360 DEG

NOZZLE CONFIGURATION

☐ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☐ 2      ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ 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 WO \_\_\_\_\_ 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 WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other \_\_\_\_\_ FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

Prepared By:  Level: II Date: 9/23/00 Sketch(s) attached ☒ yes ☐ no Sheet 2 of 9

Reviewed By:  Date: 9-25-00 Authorized Inspector:  Date: 9-26-00

R  
G  
10/19/00

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

☐ Base Metal    ☐ Weld    ☒ Near Surface    ☐ Bolting    ☐ Inner Radius

**Area Calculation**

**Volume Calculation**

ZONE I  
 SEE DRWG. 6.3 SQ. IN.

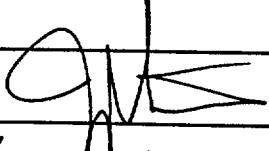

6.3 SQ. IN X 69 IN. = 434.7 CU. IN.

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70	S2	6.2	69	427.8	434.7	98.41
2	70	S1	3.2	69	220.8	434.7	50.79
3	70	CW	5.5	69	379.5	434.7	87.30
4	70	CCW	5.5	69	379.5	434.7	87.30
					1407.6	1738.8	80.95

*R/OK*  
*4/26/00*

*6/2*  
*10/19/00*

Prepared By: 		Item No: C02.021.007
Level: II	Date: 9/23/00	
Reviewed By: 	Level: III	Date: 9-25-00

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

☒ Base Metal      ☒ Weld      ☐ Near Surface      ☐ Bolting      ☐ Inner Radius

**Area Calculation**

**Volume Calculation**

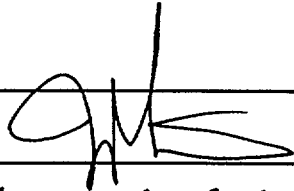

ZONES II & III  
 SEE DRWG. 17.5 SQ. IN.

17.5 SQ. IN. X 69 IN. = 1207.5 CU. IN.

**Coverage Calculations**

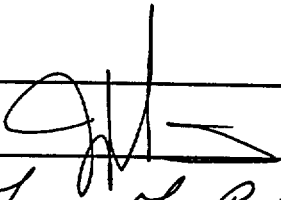
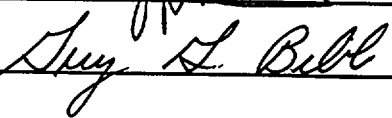
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60	S2	17.5	69	1207.5	1205.7	100.15
2	60	S1	1.5	69	103.5	1207.5	8.57
3	60	CW	14.2	69	979.8	1207.5	81.14
4	60	CCW	14.2	69	979.8	1207.5	81.14
					3270.6	4830	67.71

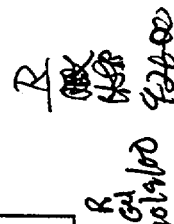
*Handwritten notes:*  
 R/S  
 9/23/00  
 9/25/00

Prepared By: 		Item No: C02.021.007
Level: II	Date: 9/23/00	
Reviewed By: 	Level: III	Date: 9-25-00

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>						NDE-91-1	
						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal		<input type="checkbox"/> Weld		<input type="checkbox"/> Near Surface		<input type="checkbox"/> Bolting	
						<input type="checkbox"/> Inner Radius	
Area Calculation				Volume Calculation			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage

60 COVERAGE 67.7%  
70 COVERAGE 81 %  
AGGREGATE COVERAGE 74.4%

Item No: C02.021.007	
Prepared By: 	Level: II Date: 9/23/00
Reviewed By: 	Level: IV Date: 9-25-00

  
9/23/00  
9/25/00



# AUX. FEED WATER NOZ E

## 70° COVERAGE AREA (ZONE I)

$$S_1 \text{ to } S_2 \quad ABC \text{ (AREA OF LOSS)} \quad \frac{.7 \times .25}{2} = .0875$$

$$\text{(TOTAL AREA)} \quad 6.3 \text{ sq. in.} - (\text{LOSS}) .0875 \text{ sq. in.} = 6.2125 =$$

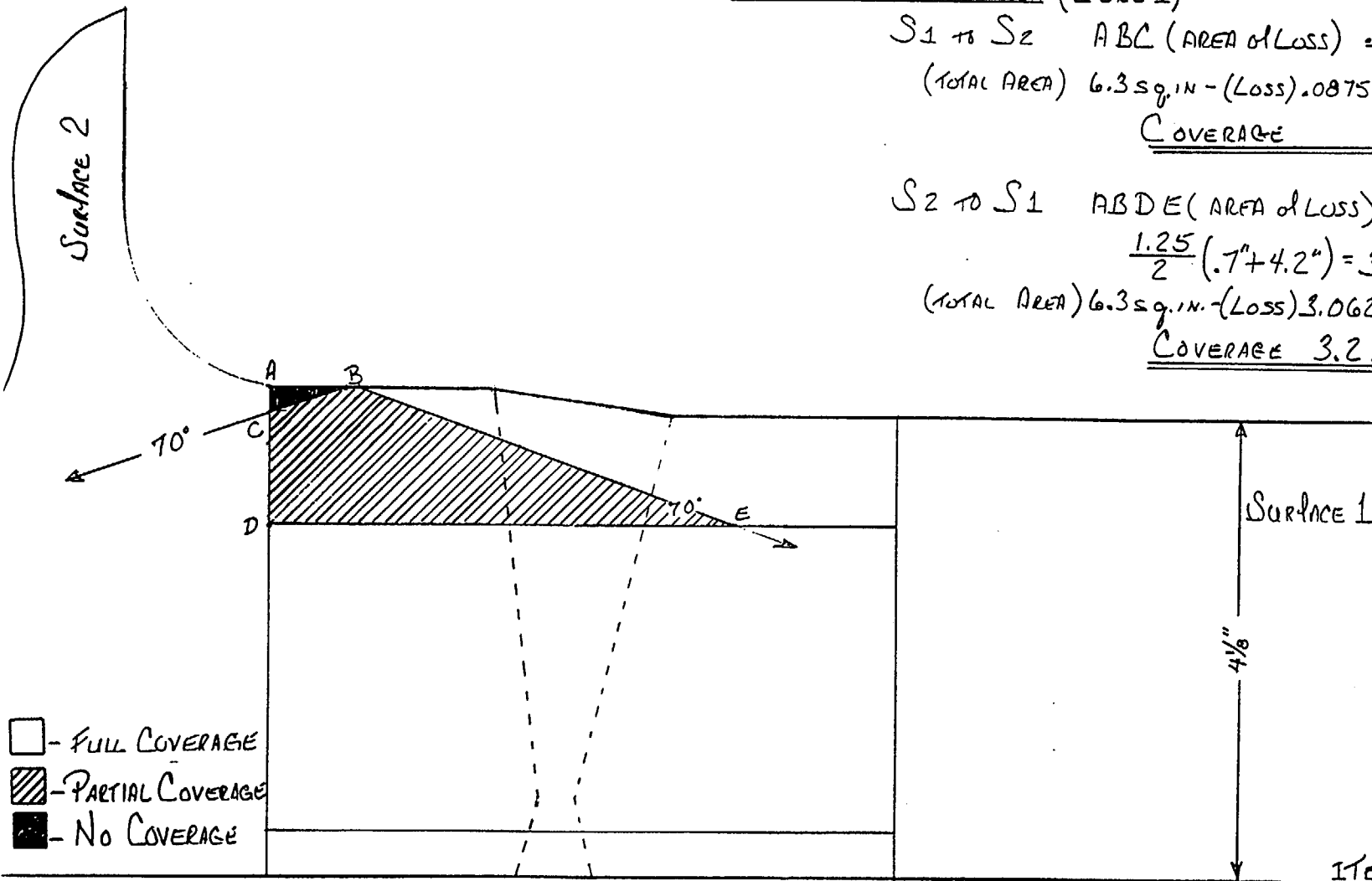
$$\underline{\underline{\text{COVERAGE} \quad 6.2 \text{ sq. in.}}}$$

$$S_2 \text{ to } S_1 \quad ABDE \text{ (AREA OF LOSS)}$$

$$\frac{1.25}{2} (.7 + 4.2) = 3.0625$$

$$\text{(TOTAL AREA)} \quad 6.3 \text{ sq. in.} - (\text{LOSS}) 3.0625 = 3.2375$$

$$\underline{\underline{\text{COVERAGE} \quad 3.2 \text{ sq. in.}}}$$



ITEM # COZ. 021.007  
 I.D. # ZSGC-WZ59  
 BY: [Signature]  
 DATE: 9/23/00  
 Pg. 7 of 9

R  
 10/19/00  
 10/19/00

AUX. FEED WATER NOZ E

70° COVERAGE (ZONE I - CIRC SCAN)

ABCD (AREA of LOSS)  $.65" \times 1.25" = .8125$

(TOTAL AREA)  $6.3 \text{ sq. in.} - (\text{LOSS}) .8125 \text{ sq. in.} = 5.4875$

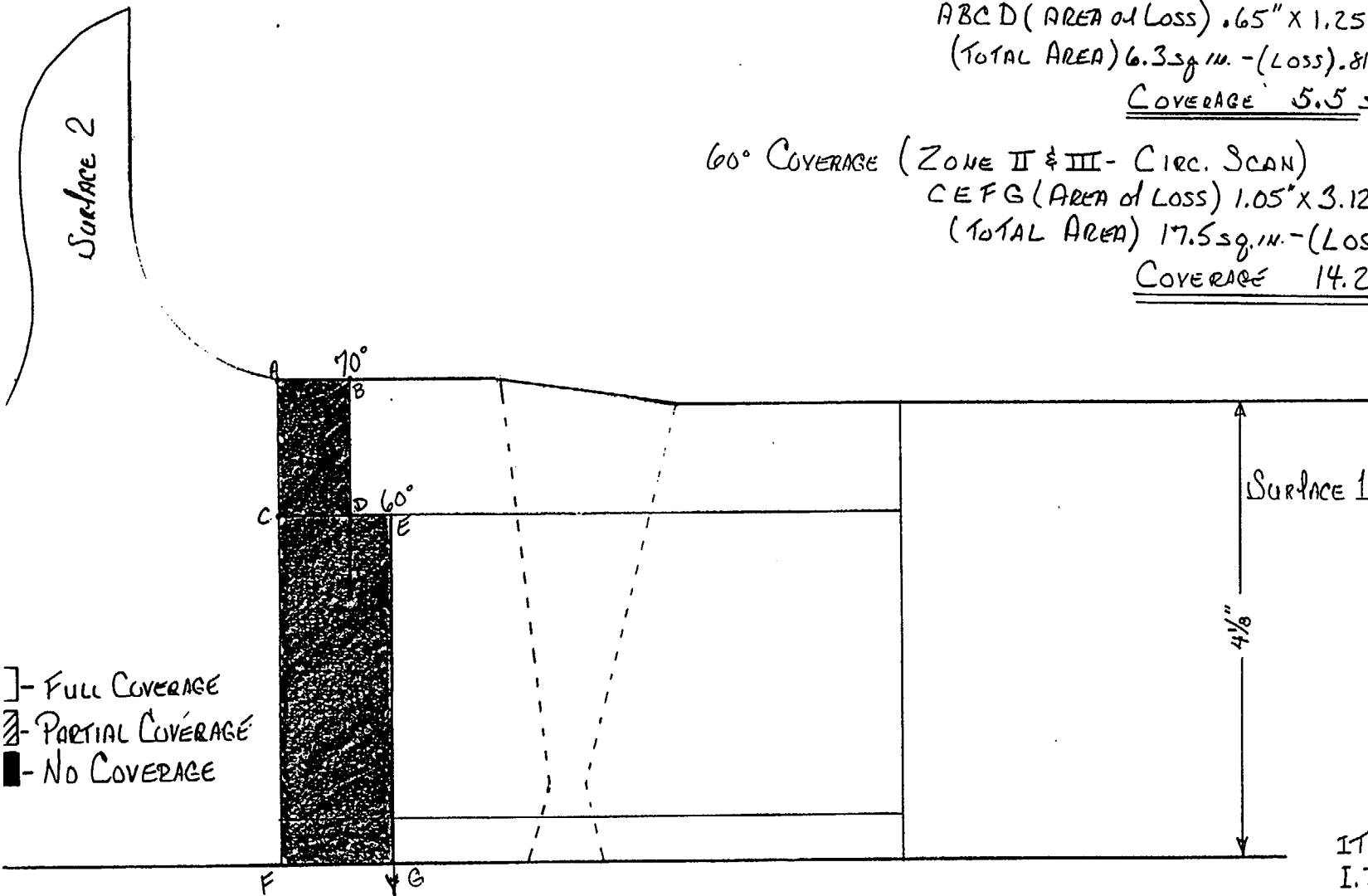
COVERAGE 5.5 sq. in.

60° COVERAGE (ZONE II & III - CIRC. SCAN)

CEFG (AREA of LOSS)  $1.05" \times 3.125" = 3.28125$

(TOTAL AREA)  $17.5 \text{ sq. in.} - (\text{LOSS}) 3.28125 \text{ sq. in.} =$

COVERAGE 14.2 sq. in.



ITEM # COZ. 021.007  
I.D. # ZSGC-WZSS  
BY:   
DATE: 9/23/00  
Pg. 8 of 9

R  
726-00  
R  
GU  
10/9/00

Aux. Feed Water No. 5

60° Coverage Area

S1 to S2 - 100% Coverage

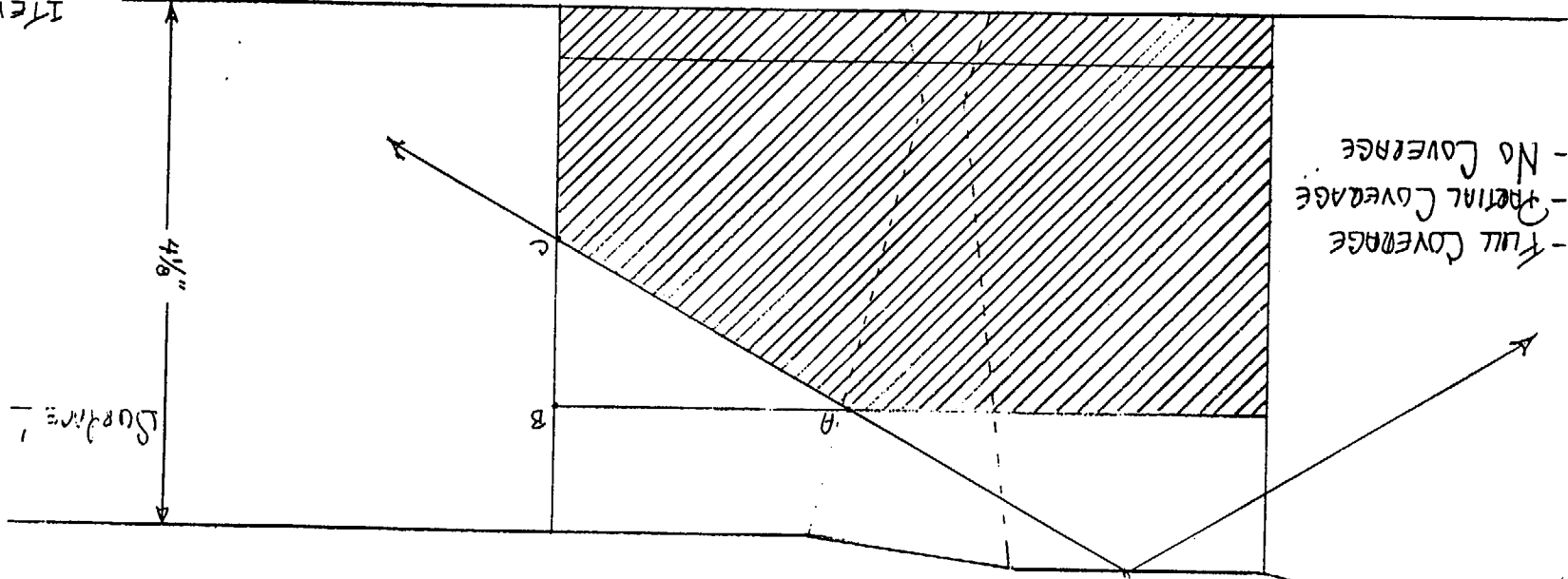
S2 to S1 ABC

$$\frac{2.3'' \times 1.3''}{2} = 1.495414''$$

$$\overline{\text{Coverage } 1.5 \text{ sq. in.}}$$

Surface 2

- Full Coverage
- Partial Coverage
- No Coverage



ITEM # CO2.021.007  
 I.D. # ZSLC-W1259  
 BY: *[Signature]*  
 DATE: 9/23/00  
 Pg. 9 of 9

*[Handwritten notes and signatures]*  
 9/26/00  
 10/19/00



# McGuire Unit #2

## EOC13

Item # C05.011.129  
Weld # 2N12F493

No Data Recorded. Reference Calibration Sheet #'s

0002028  
0002027  
            
            
          

1 of 4

R  
GU  
10/11

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2N12F493

Item No: C05.011.129

Remarks:

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

DUE TO VALVE CONFIGURATION

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

Prepared By: Larry Mauldin      Level: III      Date: 9-12-00      Sketch(s) attached ☒ yes   ☐ no      Sheet 2 of 4

Reviewed By: Larry H. Bell      Date: 9-15-00      Authorized Inspector: [Signature]      Date: 9-16-00

R  
G4  
10/10/00

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

☒ Base Metal      ☒ Weld      ☐ Near Surface      ☐ Bolting      ☐ Inner Radius

**Area Calculation**

**Volume Calculation**

\* SEE DRAWING  
.266 SQ. IN.

.266 SQ. IN. X 21 IN. = 5.586 CU. IN.  
= 5.59 CU. IN.

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60S	2	0	21	0	5.59	0.00
2	60S	1	.105	21	2.205	5.59	39.45
3	45	CW	.266	21	5.59	5.59	100.00
4	45	CCW	.266	21	5.59	5.59	100.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	13.385	22.36	59.86
2	60L	1	.161	21	3.381	5.59	60.48

LONG WAVE 60.48% OF 25% (SCAN 1) = 15.1  
LONG WAVE COVERAGE 15.12% OF TOTAL WELD

Item No: C05.011.129

Prepared By: *Randy Mauller*

Level: *III*

Date: *9-12-00*

Reviewed By: *Sgt. L. Bibb*

Level: *III*

Date: *9-15-00*

*Randy Mauller*  
*9/12/00*  
*10/10/00*

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

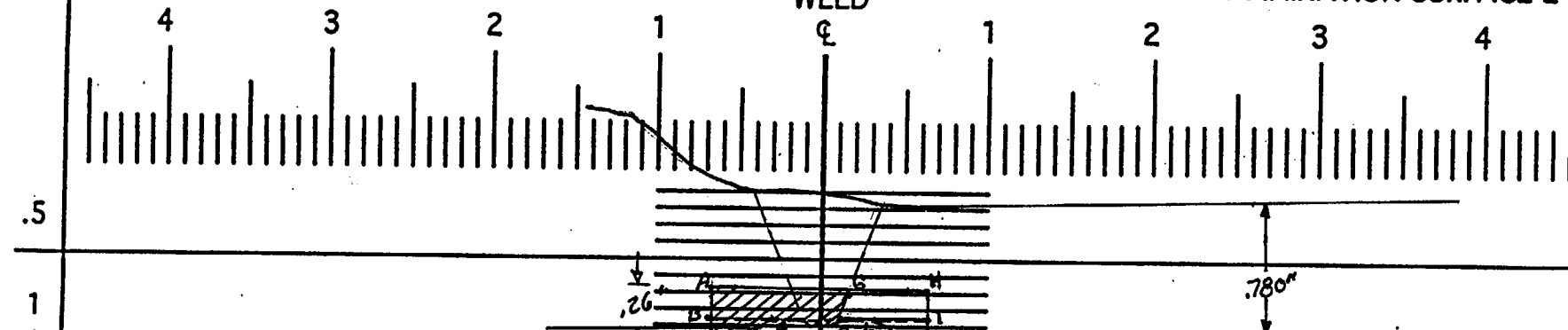
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



- 1.5 ☐ - SHEAR WAVE COVERAGE 60°  
☒ - 60° LONG. WAVE COVERAGE

SHEAR WAVE GHIF  
GHIF + IJKL  $\frac{.16}{2} (.45 + .55) = .08$   
 $\frac{.10}{2} (.3 + .2) = .025$

2.5 SHEAR WAVE = .105 sq. in.  
LONG. WAVE = .161 sq. in.

LONG. WAVE ABFG + BCDE  $\frac{.16}{2} (.85 + .75) = .128$   
 $\frac{.10}{2} (.4 + .25) = .0325 = .033$

3 TOTAL AREA .266 sq. in.

Component ID/Weld No. 2NI2F493

Remarks:

COS. 011.129

Item No: ~~309.011.129~~ 148 9-15-00

Examiner: Larry Maulder

Level: III

Date: 9-12-00

Reviewed By: [Signature]

Level: III

Date: 9-15-00

Authorized Inspector: [Signature]

Date: 9-16-00

270

Profile taken at: 0°

90

180 Sheet 4 of 4

12  
G  
10/10/00

DUKE POWER COMPANY										Exam Start: 1413		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 1416		Revision 2		
Station: McGuire			Unit: 2		Component/Weld ID: 2RCPA-TE						Date: 8/31/00			
Nominal Material Thickness (in): 0.438			Weld Length (in.): 10.9			Surface Temperature: 76° Deg F								
Measured Material Thickness (in): .460			Lo: 9.1.1.3			Pyrometer S/N: MCNDE 27021								
Surface Condition: AS GROUND			Calibration Sheet No: 0002009			Cal Due: 10/11/00								
Examiner: James L. Panel <i>James L. Panel</i> Level: II						Configuration: Tee to RCHP ACCUMULATOR S2 Flow S1 TEE to ACCUM								
Examiner: James H. Resor <i>James H. Resor</i> Level: II														
Procedure: NDE-640 Rev: 1 FC: *														
IND NO.	<i>4</i>	Ampl ≥ rem BW LOB	L1 ≥ rem BW LOB	W1 ≥ rem BW LOB	Mp1 ≥ rem BW LOB	W2 ≥ rem BW LOB	Mp2 ≥ rem BW LOB	L2 ≥ rem BW LOB	W1 ≥ rem BW LOB	Mp1 ≥ rem BW LOB	W2 ≥ rem BW LOB	Mp2 ≥ rem BW LOB	Exam Surf.	Damps
NRI	0°													

Remarks: * FC 95-18, 95-19					
		Limitations: see NDE-UT-4 <input type="checkbox"/> None: <input checked="" type="checkbox"/>		Sheet <u>1</u> of <u>6</u>	
Reviewed By: <i>Aug. L. Bulb</i>		Level: <u>III</u> Date: <u>9-6-00</u>		Authorized Inspector: <i>[Signature]</i> Date: <u>9-9-00</u>	
				Item No: C05.021.081	

**DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET**

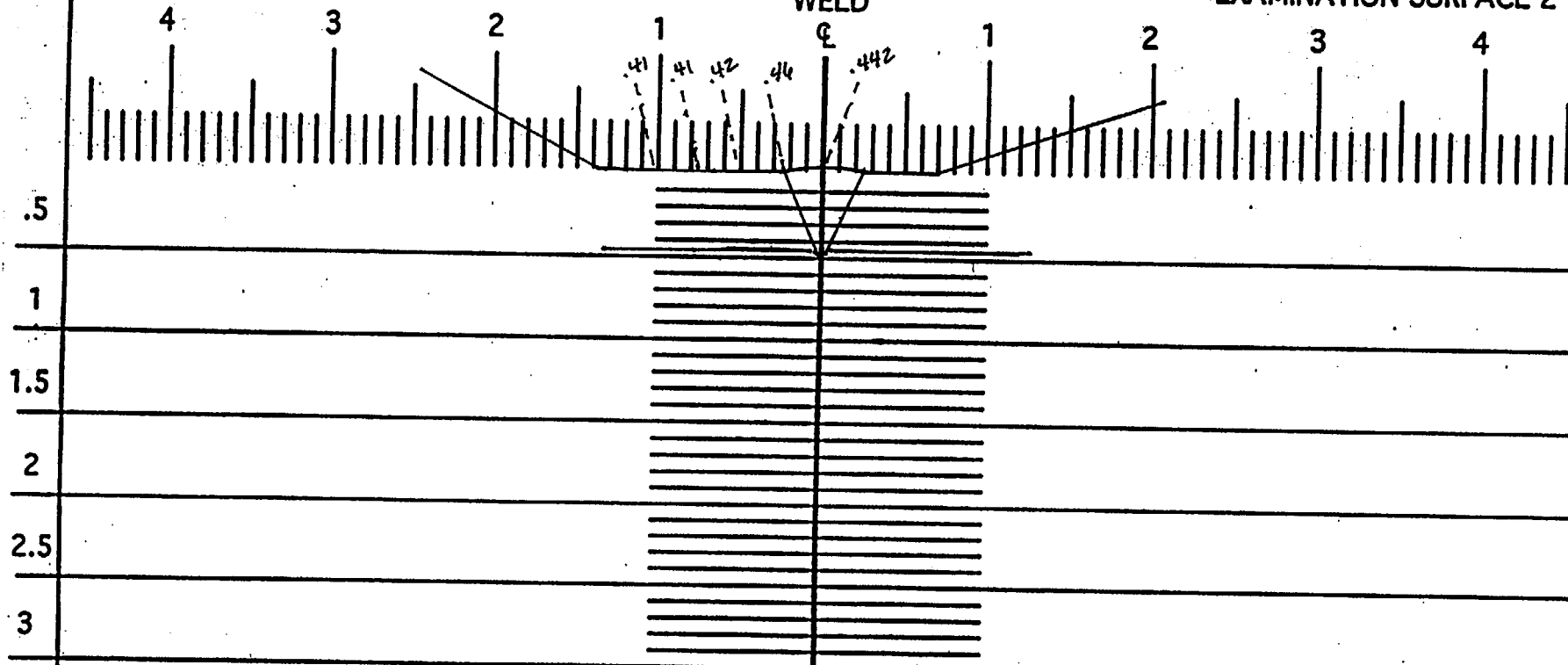
**NDE-UT-5**

**Revision 1**

**EXAMINATION SURFACE 1**

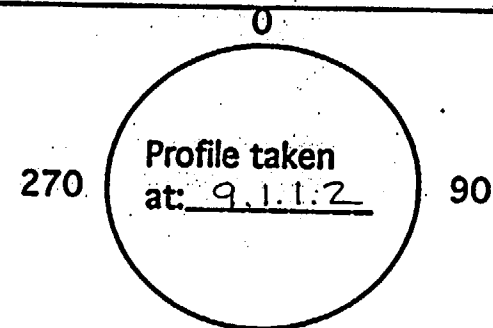
**WELD**

**EXAMINATION SURFACE 2**



**Component ID/Weld No.** 2RCPA - TE

**Remarks:**



**Item No:** C05.021.081

**Examiner:** *James H. Besor*

**Level:** II

**Date:** 8-31-00

**Reviewed By:** *Doug L. Bibb*

**Level:** III

**Date:** 9-6-00

**Authorized Inspector:** *[Signature]*

**Date:** 9-9-00

**180 Sheet 2 of 6**

*R  
G  
10/10/00*

# McGuire Unit #2

## EOC13

Item # C05.021.081  
Weld # 2 RC PA - TE

No Data Recorded. Reference Calibration Sheet #'s

0002007  
0002008

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

☒ Base Metal    ☒ Weld    ☐ Near Surface    ☐ Bolting    ☐ Inner Radius

**Area Calculation**

1.0 X .15 = .15 SQ. IN.

**Volume Calculation**

.15 SQ. IN. X 11" = 1.65 CU. IN.

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	.15	11	1.65	1.65	100.00
2	45°	CCW	.15	11	1.65	1.65	100.00
3	60°S	S1	0	11	0	1.65	0.00
4	60°S	S2	.049	11	0.539	1.65	32.67
	60 S	SHEAR WAVE	AGGREGATE	COVERAGE	3.839	6.6	58.17
	L-WAVE						
4	60L	2	.083	11	0.913	1.65	55.33

L-WAVE COVERAGE = 55.33% OF 25% (SCAN 4) = 13.8 %  
 13.8% OF TOTAL WELD

Item No: C05.021.081

Prepared By: *James H. Besa*

Level: *II*

Date: *9-6-00*

Reviewed By: *Larry L. Bibb*

Level: *TII*

Date: *9-6-00*

*2/*  
*9-6-00*  
*10/10/00*



Station MNS

Unit 2

Rev

File No.

Sheet 5 of 6

Subject C05.021.081

2 RCPA - TE

By JAMES H. BESOR

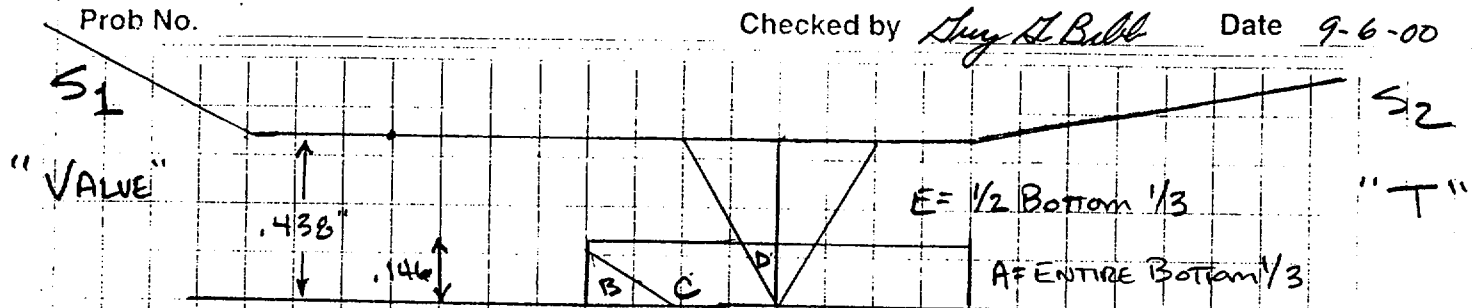
Date 9-6-00

Checked by

Guy L. Bell

Date 9-6-00

Prob No.



SKETCH DRAWN 2X ACTUAL

$$A = 1.0 \times .15 = .15 \text{ (TOTAL DESIRED VOLUME) or (AREA CALCULATION)}$$

$$B = \frac{.25 \times .15}{2} = .01875 \text{ (AREA NOT COVERED BY SHEARWAVE)}$$

$$C = .075 - .01875 - .0075 = .04875 \text{ (.60° SHEAR COVERAGE)}$$

$$D = \frac{.10 \times .15}{2} = .0075 + .075 = .0825 \text{ (D+E) = (AREA SHEARWAVE WONT PUNCH DO TO WELD)}$$

$$E = .15 \div 2 = .075 \text{ } 1/2 \text{ Bottom } 1/3$$

$$L\text{-WAVE COVERAGE} = .075 + .0075 = .0825$$

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2RCPA-TE

Item No: C05.021.081

Remarks:

☐ NO SCAN  
☒ LIMITED SCAN

SURFACE  
☐ 1 ☒ 2

BEAM DIRECTION  
☒ 1 ☐ 2 ☐ cw ☐ ccw

FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO CL + .5" to BEYOND

ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other 60L FROM 0 DEG to 360° DEG

LIMITED TO WELD TO VALVE CONFIGURATION

☐ NO SCAN  
☐ LIMITED SCAN

SURFACE  
☒ 1 ☐ 2

BEAM DIRECTION  
☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO CL + 1.4 to BEYOND

ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other \_\_\_\_\_ FROM 0 DEG to 360° DEG

LIMITED TO PIPE TO "T" CONFIGURATION

☐ NO SCAN  
☐ LIMITED SCAN

SURFACE  
☐ 1 ☐ 2

BEAM DIRECTION  
☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other \_\_\_\_\_ FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

☐ NO SCAN  
☐ LIMITED SCAN

SURFACE  
☐ 1 ☐ 2

BEAM DIRECTION  
☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other \_\_\_\_\_ FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

Prepared By: *James H. Bason*

Level: II

Date: 9-6-00

Sketch(s) attached ☒ yes ☐ no

Sheet 6 of 6

Reviewed By: *Greg L. Babb*

Date: 9-6-00

Authorized Inspector: *[Signature]*

Date: 9-9-00

R  
G  
10/10/00