



H. B. Barron
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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.¹

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

Sincerely,

H. B. Barron

Enclosure

¹ 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:

Mr. L. A Reyes
US Nuclear Regulatory Commission, Region II
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Mr. R. E. Martin, Project Manager (addressee only)
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
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S. M. Shaeffer
Senior NRC Resident Inspector
McGuire Nuclear Station

bxc w/o encl: R.K. Rhyne
R. Branch
G.J. Underwood
D.E. Caldwell
G.D. Scarboro
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

DUKE POWER COMPANY Limited Examination Coverage Worksheet	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>

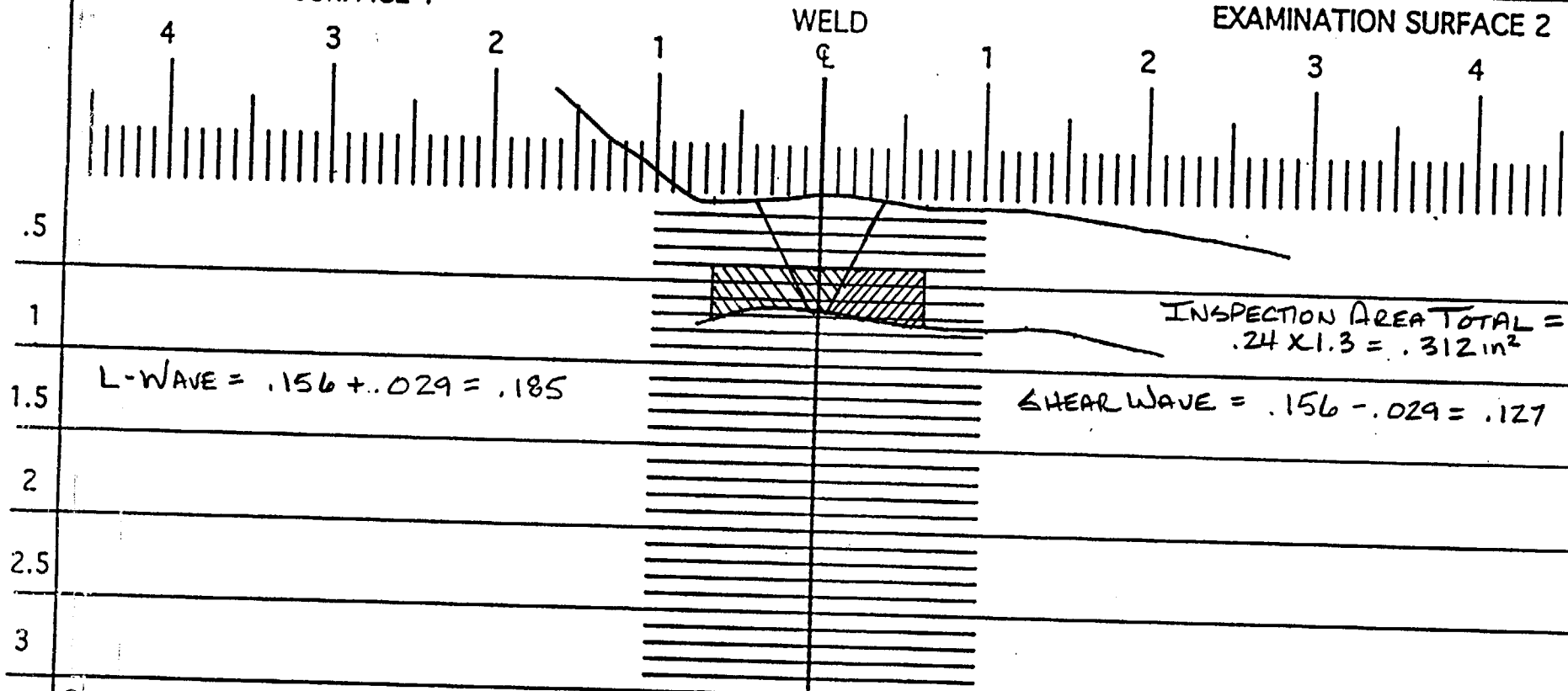
DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

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

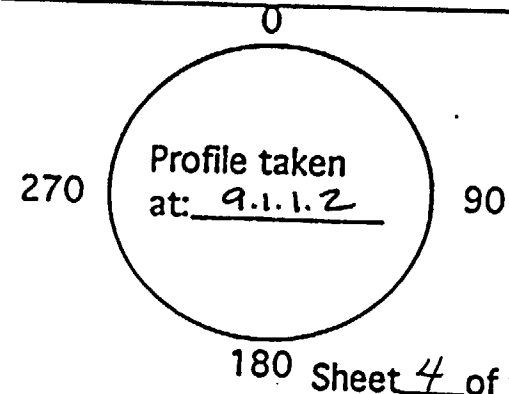
Reviewed By: *Greg S. Ball*

Level: III

Date: 9-25-00

Authorized Inspector: *[Signature]*

Date: 9-26-00



180 Sheet 4 of 4

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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

R
Gu
10/4

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: MD Klein

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/
ASB
9/25/02

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>

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GA
10/2/01

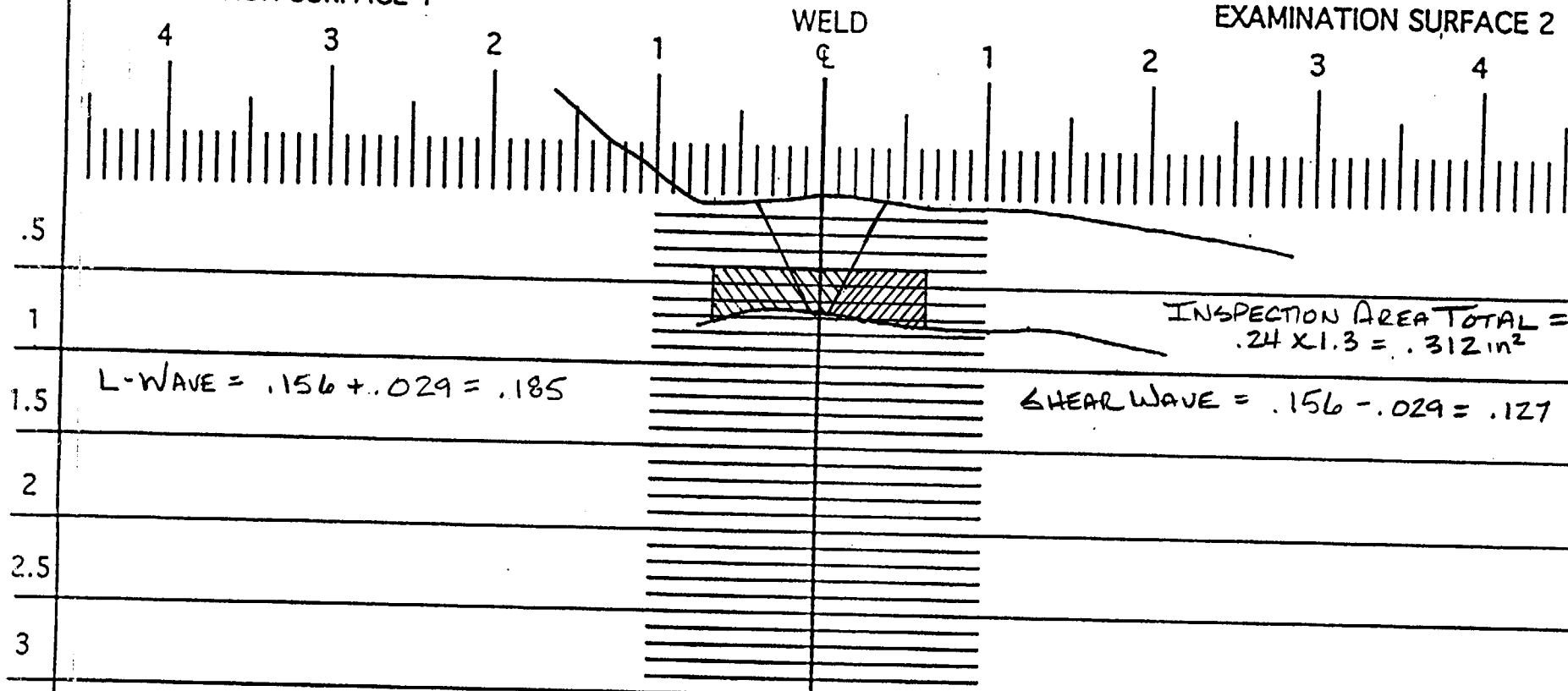
DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 2NC2FWS3-37

Remarks:

Examiner:

James H. Beeson

Item No: B09.011.039

Level: II

Date: 9-20-00

Reviewed By:

Greg L. Balle

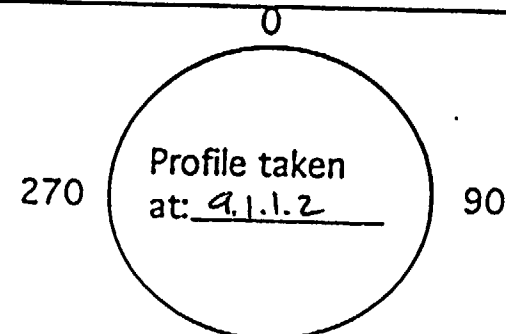
Level: III

Date: 9-25-00

Authorized Inspector:

[Signature]

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

DUKE POWER COMPANY Limited Examination Coverage Worksheet	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
 9/12/00

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

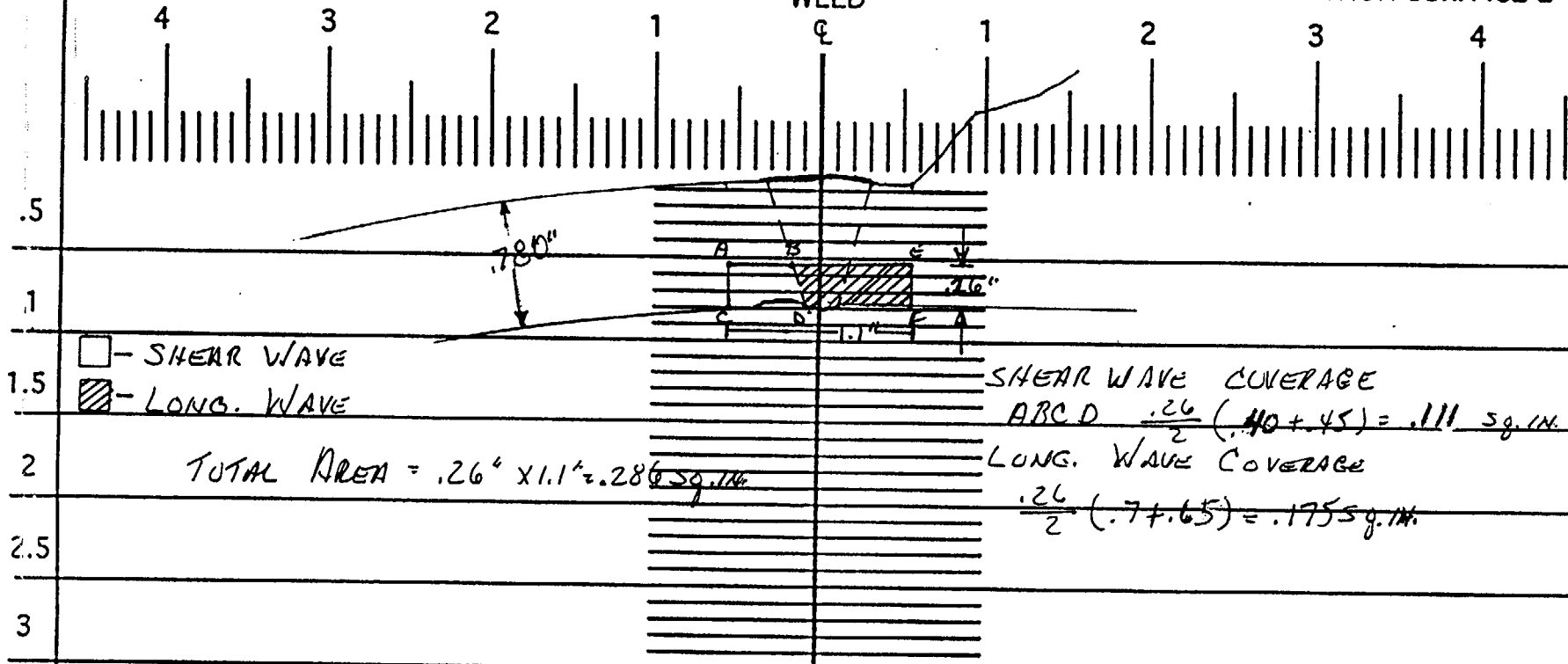
NDE-UT-5

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 # 2N 12F 494

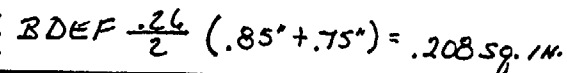
No Data Recorded. Reference Calibration Sheet #'s

000 20 27
000 20 28

1 of 4

Revision 1

EXAMINATION SURFACE 2



180 Sheet 2 of 4

R
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10/4/02

DUKE POWER COMPANY Limited Examination Coverage Worksheet	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>ZSGC-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 _{max}	% FSH	L _{max}	W _{max}	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 & 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:

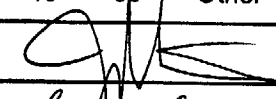
☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☒ 2 ☒ cw ☒ ccw
 FROM L _____ to L _____ INCHES FROM WO _____ CL + 2" _____ to _____ BEYOND _____
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other _____ 70 _____ FROM _____ 0 _____ DEG to _____ 360 _____ DEG

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: Jerry S. Bell 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.

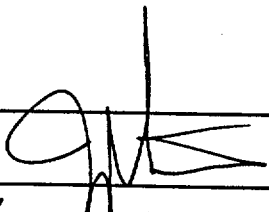

6.3 SQ. IN X 69 IN. = 434.7 CU. IN.

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 9/26/00

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

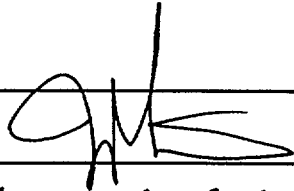

ZONES II & III
 SEE DRWG. 17.5 SQ. IN.

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

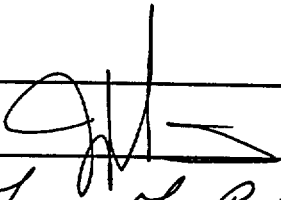
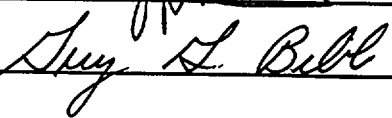
Prepared By: 		Item No: C02.021.007
Level: II	Date: 9/23/00	
Reviewed By: 	Level: III	Date: 9-25-00

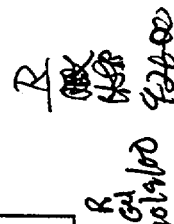
DUKE POWER COMPANY Limited Examination Coverage Worksheet						NDE-91-1	
						Revision 0	
Examination Volume/Area Defined							
<input type="checkbox"/> Base Metal		<input type="checkbox"/> Weld		<input type="checkbox"/> Near Surface		<input type="checkbox"/> Bolting	
						<input type="checkbox"/> Inner Radius	
Area Calculation				Volume Calculation			
Coverage Calculations							
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%

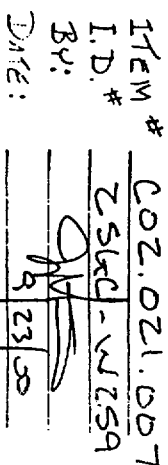
70 COVERAGE 81 %

AGGREGATE COVERAGE 74.4%

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


 9/23/00
 9/25/00

Exam Areas:

$$ABCD + EFAE \quad 1.0 \text{ in.} \times 5.6 \text{ in.} + \frac{25}{2} (2.0 + 3.6) = \underline{6.35 \text{ g.in.}}$$
$$3.125 \text{ IN.} \times 5.6 \text{ IN.} = \underline{17.5 \text{ sq. IN.}}$$


For
10/12/02

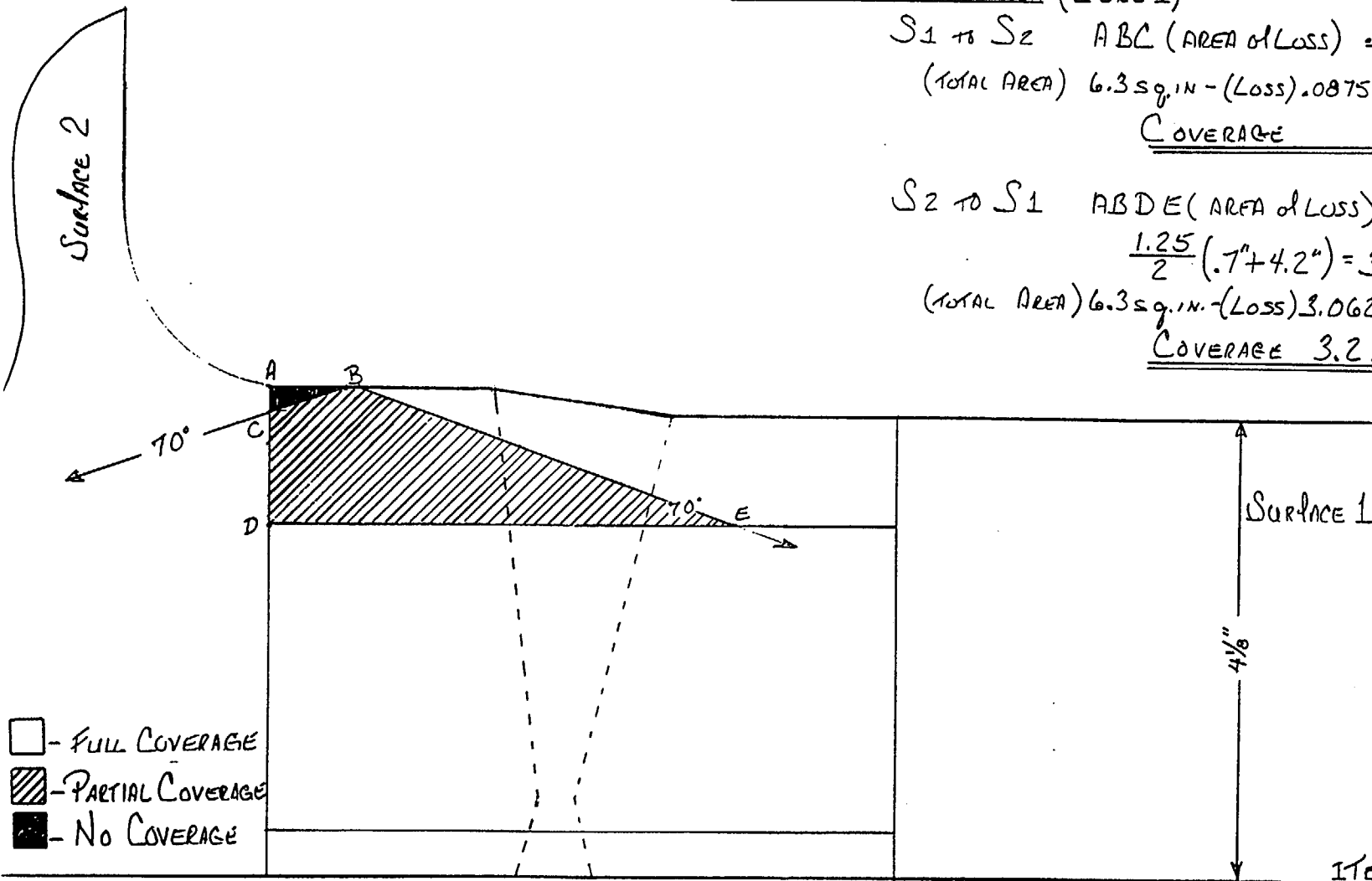
AUX. FEED WATER NOZ E

70° COVERAGE AREA (ZONE I)

$$S_1 \text{ to } S_2 \quad ABC \text{ (AREA OF LOSS)} \quad \frac{.7 \times .25}{2} = .0875$$
$$\text{(TOTAL AREA)} \quad 6.3 \text{ sq. in.} - (\text{LOSS}) .0875 \text{ sq. in.} = 6.2125 =$$
$$\underline{\underline{\text{COVERAGE} \quad 6.2 \text{ sq. in.}}}$$

S2 TO S1 ABDE (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
H
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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) $6.3 \text{ sq. in.} - (\text{LOSS}) .8125 \text{ sq. in.} = 5.4875$

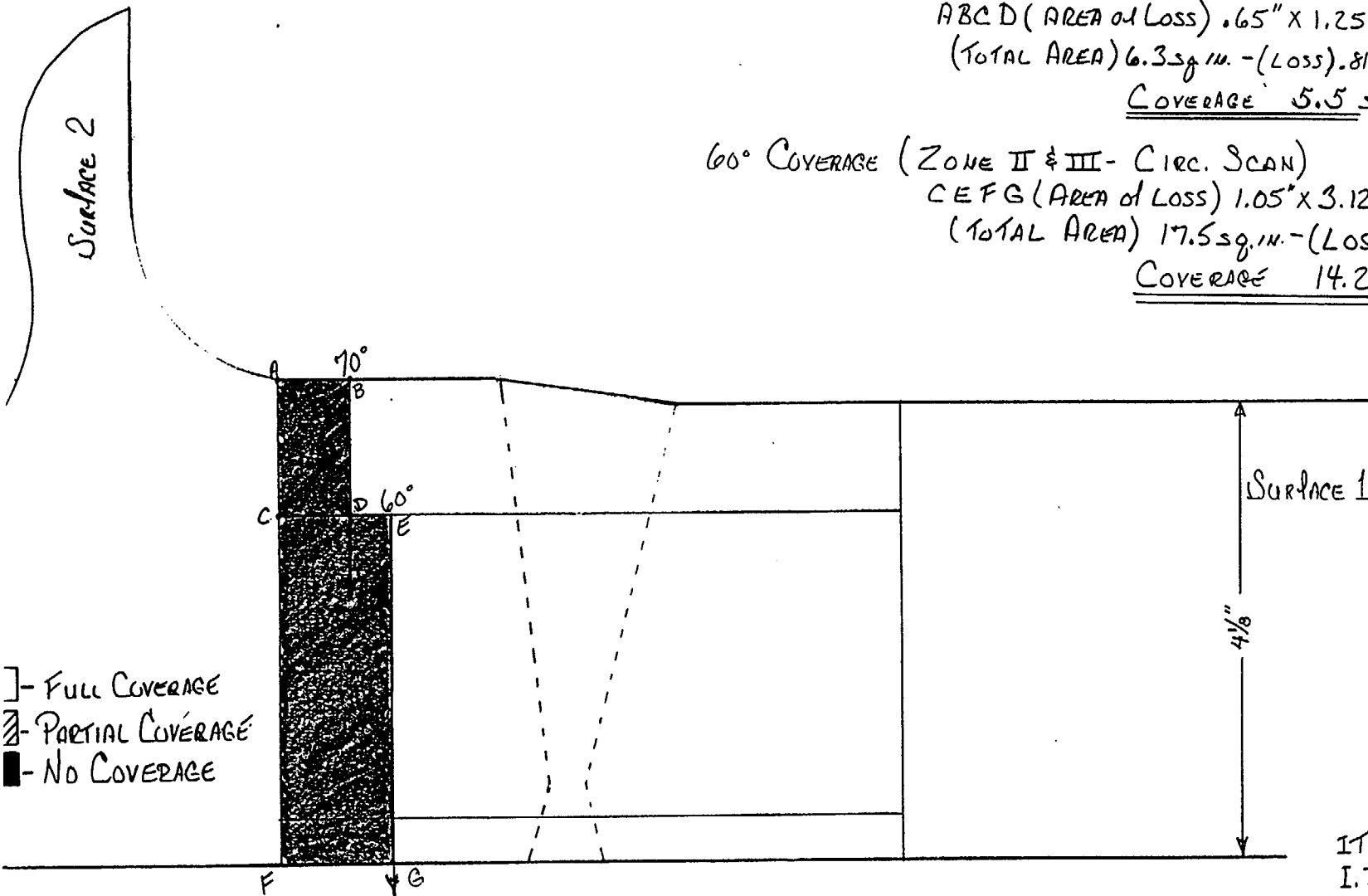
COVERAGE 5.5 sq. in.

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: *[Signature]*
 DATE: 9/23/00
 Pg. 8 of 9

[Handwritten notes]
 R 10/9/00
 726-00

Aux. Feed Water No. 5

60° Coverage Area

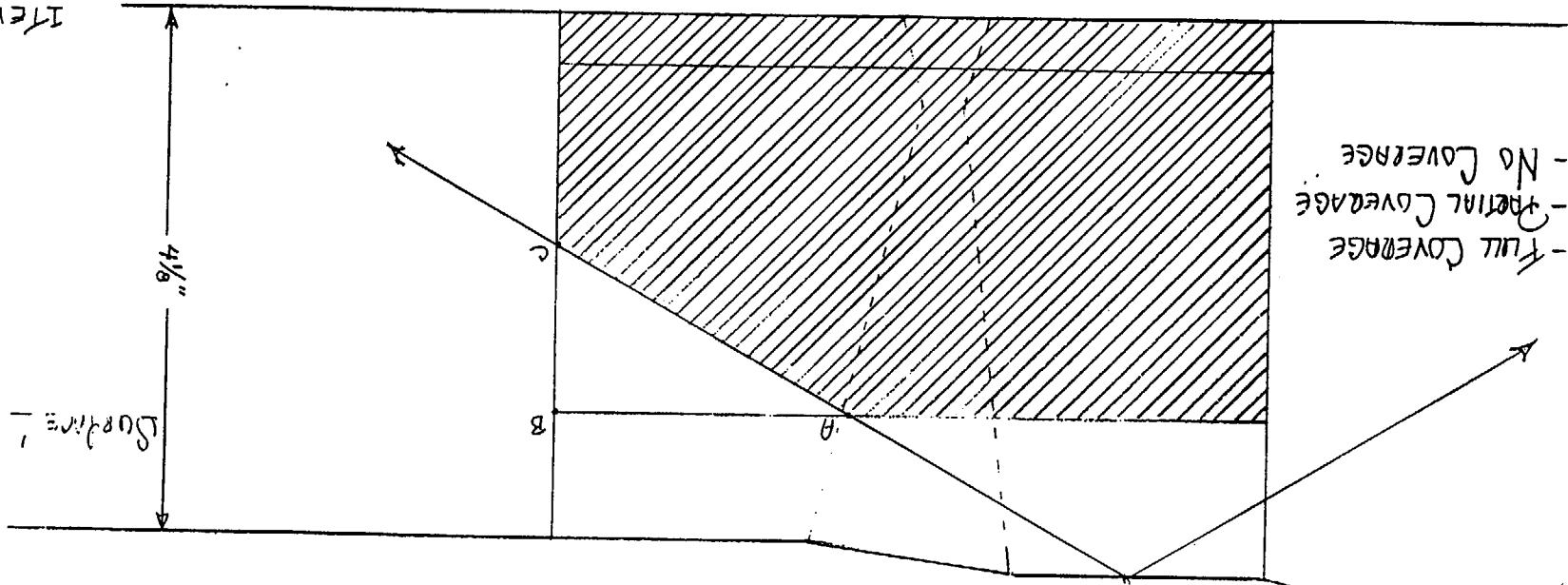
S1 to S2 - 100% Coverage
S2 to S1 ABC

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

Coverage 1.5 sq in

Surface 2

- Full Coverage
- Partial Coverage
- No Coverage



ITEM # CO2.021.007
I.D.# 2512-41259
BY: [Signature]
Date: 9/23/00
Pg. 9 of 9

9/26/00
64
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*

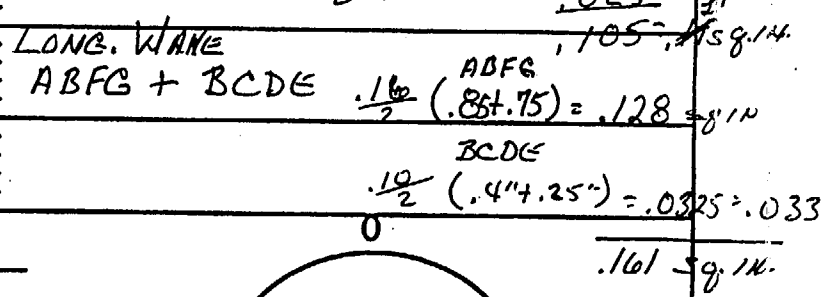
Level: *III*

Date: *9-15-00*

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

Revision 1

EXAMINATION SURFACE 2



: Remarks:

Date: 5/13/00

Authorized Inspector:

90

180 Sheet 4 of 4

12
64
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								
Examiner: James H. Resor <i>James H. Resor</i> Level: II														
Procedure: NDE-640 Rev: 1 FC: *						S2 Flow S1								
						TEE to ACCUM								
IND NO.		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>W. Rein</i>			Date: <u>9-9-00</u>		Item No: C05.021.081		

REQUEST FOR RELIEF 01-001
ATTACHMENT 3
PAGE 5 OF 10

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

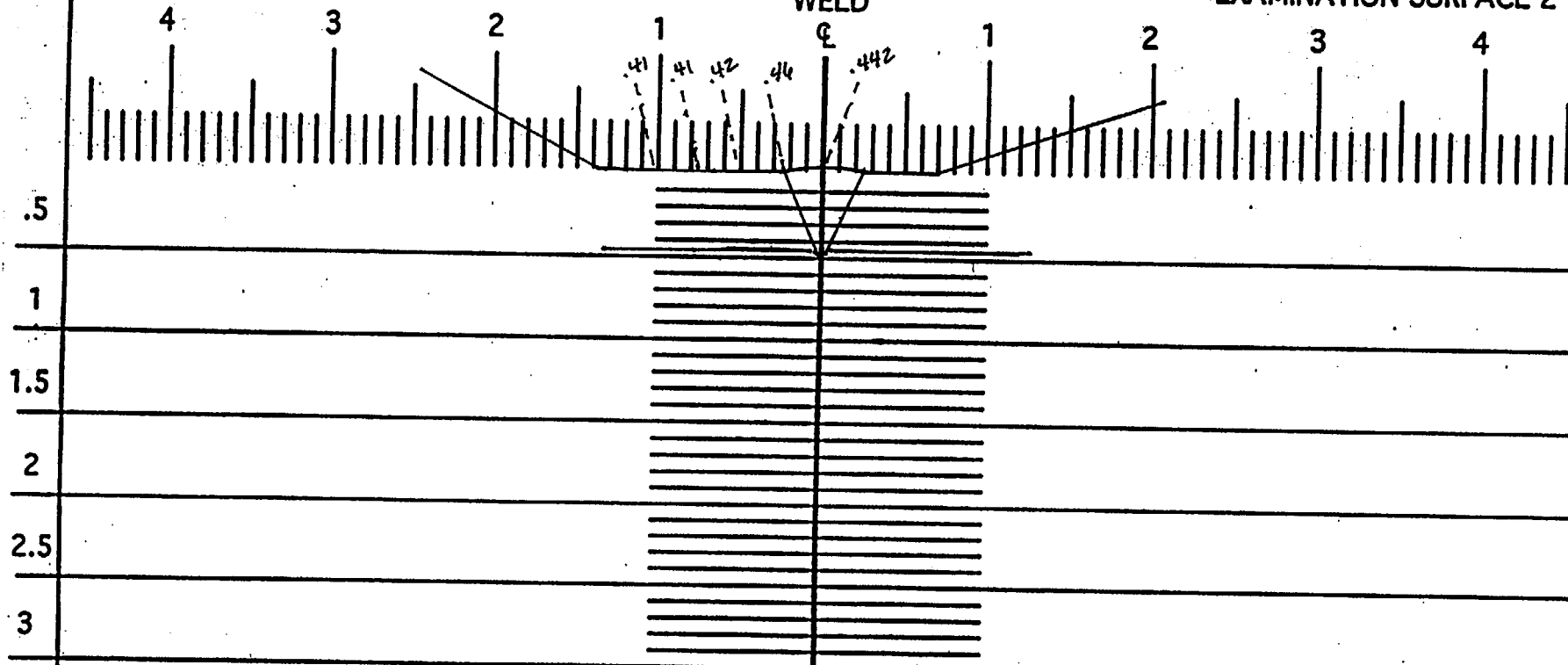
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

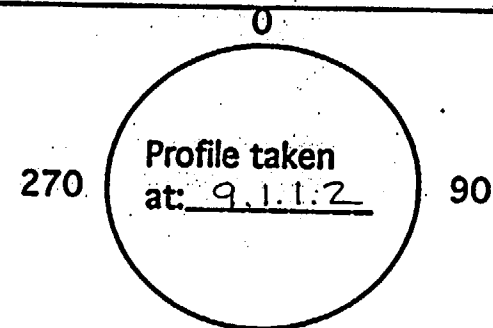
WELD

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: *Dwight 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

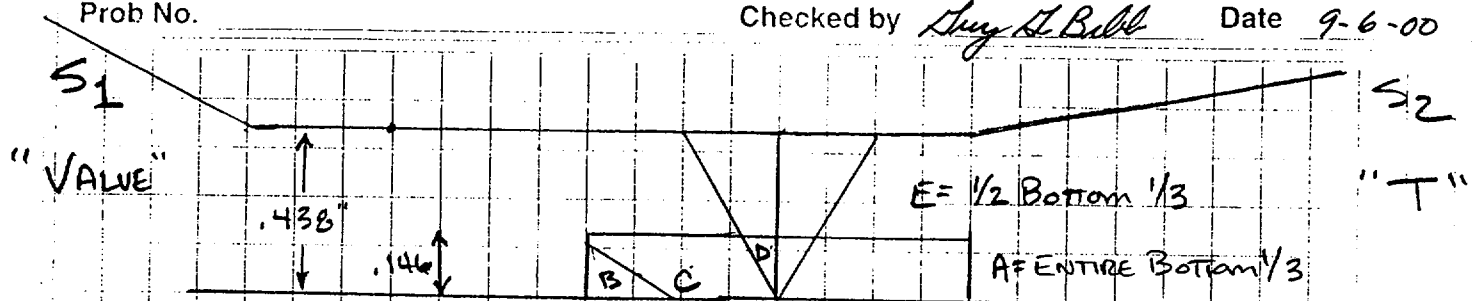
Date 9-6-00

Checked by

Guy L. Bell

Date 9-6-00

Prob No.



SKETCH DRAWN 2X ACTUAL

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

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

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

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

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

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

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 _____

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