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April 26, 2000

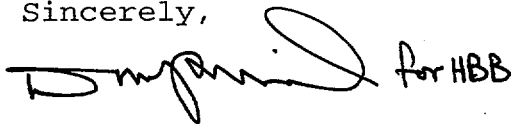
U. S. Nuclear Regulatory Commission
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Subject: Revision 1 of the Inservice Inspection Report for
McGuire Refueling Outage 1/EOC-9
McGuire Nuclear Station Unit 1
Docket No. 50-369

Attachment 2 contains the revised sections (revision 1) to the subject Inspection Report. Attachment 1 describes how attachment 2 affects the previous submittal of this report. Section 9 of attachment 2 contains two relief requests, which are included as references to the subject Inspection Report. NRC staff review of these relief requests have been requested through previous submittals.

Questions on this matter should be directed to Norman T. Simms, McGuire Licensing and Compliance, at (704) 875-4685.

Sincerely,



for HBB

H. B. Barron, Vice President
McGuire Nuclear Station

Attachments

A047

U.S. Nuclear Regulatory Commission
April 26, 2000
Page 2 of 2

cc: Mr. L. A Reyes
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Mr. F. Rinaldi, Project Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 9H3
Washington, D.C. 20555

S. M. Shaeffer
Senior NRC Resident Inspector
McGuire Nuclear Station

bxc w/o att: N.T. Simms
J.O. Barbour
R. Branch
G.J. Underwood
D.E. Caldwell
R.K. Rhyne
G.D. Scarboro
R.D. Klein (MG01MM)

bxc w/ att: Master File # 1.3.2.13
RGC File
NRIA File/ELL

UNIT1 OUTAGE EOC-9
Attachment 1

| Delete | ADD |
|--|---|
| NIS-1 dated 01/25/95 Pages 1 and 2 Supercede keep for historical record | NIS-1 dated 09/22/99 Pages 1 and 2 |
| Inservice Inspection Report Coversheet Rev. 0 | Inservice Inspection Report Coversheet Rev. 1 |
| Table of Contents Rev.0 | Table of Contents Rev.1 |
| Section 4.0 Rev. 0 Pages 1 and 2 | Section 4.0 Rev.1 Pages 1 and 2 |
| Section 4.0 (Plan Report 01/23/1995) Page 12 | Section 4.0 (Plan Report 09/15/1999) Page 12 |
| Section 5.0 Pages 1 and 2 Rev.0 | Section 5.0 Pages 1 and 2 Rev.1 |
| Section 5.2 Page 3 Rev.0 | Section 5.2 Page 3 Rev.1 |
| Section 5.0 (Run-D, 01/23/1995) Pages 1,2,3,4,6,8 and 13 | Section 5.0 (Run-D, 09/15/1999) Pages 1,2,3,4,6,8 and 13 |
| Section 8.0 Page 1 Rev.0 | Section 8.0 Page 1 Rev.1 and add PIP 0- G99-0198 after 1M94-1467 |
| Section 9.0 Page 1 Rev.0 | Section 9.0 Page 1 Rev.1 add Request for Relief 98-001 and Request for Alternative 99-002 after RFR 94-GO-002 |

ATTACHMENT 2

**REVISED SECTIONS OF THE INSERVICE INSPECTION REPORT
FOR McGUIRE REFUELING OUTAGE 1/EOC-9**

FORM NIS-1 OWNER'S DATA REPORT FOR INSERVICE INSPECTIONS**As required by the Provisions of the ASME Code Rules**

1. Owner: Duke Energy Corporation, 526 S. Church St., Charlotte, NC 28201-1006
(Name and Address of Owner)
2. Plant: McGuire Nuclear Station, Highway 73 Cowans Ford, N.C. 28216
(Name and Address of Plant)
3. Plant Unit: 1 4. Owner Certificate of Authorization (if required) N/A
5. Commercial Service Date: December 1, 1981 6. National Board Number for Unit 44
7. Components Inspected:

| Component or Appurtenance | Manufacturer or Installer | Manufacturer or Installer Serial No. | State or Province No. | National Board No. |
|------------------------------|--|--|--------------------------|-----------------------|
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | See Section 1.1 in the Attached Report | | | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |

Note: Supplemental sheets in form of lists, sketches, or drawings may be used provided (1) size is 8¹/₂ in. x 11 in., (2) information in items 1 through 6 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-1 (Back)

8. Examination Dates 06/13/93 to 10/27/94
9. Inspection Period Identification: First Period of the Second Interval
10. Inspection Interval Identification: Second Inservice Inspection Interval
11. Applicable Edition of Section XI 1986 Addenda None
12. Date/Revision of Inspection Plan: September 28, 1992 / Revision 0
13. Abstract of Examinations and Test. Include a list of examinations and tests and a statement concerning status of work required for the Inspection Plan. See Sections 3.0 and 4.0
14. Abstract of Results of Examination and Tests. See Section 5.0
15. Abstract of Corrective Measures. See Section 8.0

We certify that a) the statements made in this report are correct b) the examinations and tests meet the Inspection Plan as required by the ASME Code, Section XI, and c) corrective measures taken conform to the rules of the ASME Code, Section XI.

Certificate of Authorization No. (if applicable) N/A Expiration Date N/A

Date 9/22 19 99 Signed Duke Energy Corp. By R. Kevin Rhyme
Owner

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State of Province of N.C., employed by * The HSBI&I Co. of HARTFORD, CT. have inspected the components described in this Owners' Report during the period 6-13-93 to 10-27-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and tests and taken corrective measures described in the Owners' Report in accordance with the Inspection Plan and as required by the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations, test, and corrective measures described in this Owners' Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection

R. Klein Commissions NB 7728, NC 853, N-I
Inspector's Signature National Board, State, Province, and Endorsements

Date 9-25-99 19 99

* The Hartford Steam Boiler Inspection & Insurance Co.
200 Ashford Center North
Suite 300
Atlanta, GA. 30338

INSERVICE INSPECTION REPORT

UNIT 1 McGuire 1994 REFUELING OUTAGE 9

NRC Docket No. 50-369

Location: Hwy 73, Cowans Ford, North Carolina

National Board NO. 44

Commercial Service Date: December 1, 1981

Owner: Duke Power Company
526 S. Church St.
Charlotte, N. C. 28201-1006

Revision 1

Prepared By: Gary Underwood Date 9/22/99
Reviewed By: Gary S. Aulboro Date 9/22/99
Approved By: R. Kevin Rhyme Date 9/22/99

Copy No. 2 Assigned To NRC DOCUMENT CONTROL

Controlled X Uncontrolled

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| <u>Section</u> | <u>Title</u> | <u>Revision</u> |
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| 1. | General Information | 0 |
| 2. | Summary of Inservice Inspections for Outage 9 | 0 |
| 3. | Second Ten Year Interval Inspection Status | 0 |
| 4. | Final Inservice Inspection Plan for Outage 9 | 1 |
| 5. | Results of Inspections Performed During Outage 9 | 1 |
| 6. | Reportable Indications | 0 |
| 7. | Personnel, Equipment, and Material Certifications | 0 |
| 8. | Corrective Action | 1 |
| 9. | Reference Documents | 1 |
| 10. | Class 1 and 2 Repairs and Replacements | 0 |

4.0 Final Inservice Inspection Plan For Outage 9

The final ISI Plan presented in this section lists all examinations credited for Outage 9 at McGuire Unit 1. This includes ASME Section XI Class 1 and 2, augmented and any alternate examinations required by the plant technical specifications, NRC Bulletins and Problem Investigation Process Forms.

4.1 The information shown below is a field description for the reporting format included in this section of the report:

A. Items examined by NDE methods

| | |
|---------------------|--|
| Item Number | = ASME Section XI Tables IWB-2500-1 (Class 1), IWC-2500-1 (Class 2), IWF-2500-1 (Class 1, Class 2), Augmented and Alternate Requirements |
| ID Number | = Unique Identification Number |
| Drawing Number | = Location and/or Detail Drawing |
| Locs. | = Location |
| Insp. Req. | = Examination Technique - Magnetic Particle, Dye Penetrant, etc. |
| Proc. Numbers | = Examination Procedures |
| Material Type/Grade | = General Description of Material |
| Diam./Thick | = Diameter/Thickness |
| Calib. Block | = Calibration Block Number |
| Comments | = General and/or Detail Description |

B. Items examined by Pressure Testing

Item Number = ASME Section XI Tables IWB-2500-1
(Class 1), IWC-2500-1 (Class 2)

Drawing Number = Number of the Flow Diagram

Revision = Revision of the Flow Diagram

Test = Type of Pressure Test

Comp = Vessel, Piping or Pump

Comp Name = Example: Reactor Vessel, etc.; for
piping-System designation will be
used

Req. Insp = Type inspection performed, i.e., VT2

Req. Proc = Required inspection procedure

Comments = General and/or Detail Description

CATEGORY B-H. Integral Attachments for Vessels

DUKE POWER COMPANY
 QUALITY ASSURANCE TECHNICAL SERVICES
 Inservice Inspection Database Management System
 McGuire Unit 1

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Pressurizer

Inservice Inspection Plan for Interval 2 Outage 2

| ITEM NUMBER | ID NUMBER | ISO/DWG NUMBERS | PROC | INSP REQ | MAT/SCH | DIA/THK | CAL BLOCKS | COMMENTS |
|---|------------|---------------------------------|--------|----------|---------|-----------------|------------|--|
| Integrally Welded Attachments | | | | | | | | |
| B08.020.001 | 1PZR-SKIRT | MCM-1201.01-170 EDSK-379441B | NDE-25 | MT | CS | 87.000 1.500 | ----- | PZR SUPPORT SKIRT TO LOWER HEAD RFO 9 EXAMINED PER IWB-2430 REF. PIP 1-M94-1233 , Request For Alternative 99-002 Reference PIP 0-G99-0198 |
| B08.020.002 | 1PZR-W13A | MCM-1201.01-170 EDSK-379438B | NDE-25 | MT | CS | 6.000 4.000 | ----- | PZR SEISMIC LUG TO SHELL Y-Z QUADRANT |
| B08.020.003 | 1PZR-W13B | MCM-1201.01-170 EDSK-379438B | NDE-25 | MT | CS | 6.000 4.000 | ----- | PZR SEISMIC LUG TO SHELL Y-X QUADRANT |
| B08.020.004 | 1PZR-W13C | MCM-1201.01-170 EDSK-379438B | NDE-25 | MT | CS | 6.000 4.000 | ----- | PZR SEISMIC LUG TO SHELL X-W QUADRANT |
| B08.020.005 | 1PZR-W13D | MCM-1201.01-170 EDSK-379438B | NDE-25 | MT | CS | 6.000 4.000 | ----- | PZR SEISMIC LUG TO SHELL W-Z QUADRANT |

Total B08.020 Items: 5

Total Category B-H Items: 5

5.0 Results Of Inspections Performed During Outage 9

The results of each examination shown in the final ISI Plan (Section 4 of this report) are included in this section. The completion date and status for each examination are shown. All examinations revealing reportable indications are described in further detail in Section 6.

5.1 The information shown below is a field description for the reporting format included in this section of the report:

A. Items examined by NDE methods

| | | |
|---------------------|---|---|
| Item Number | = | ASME Section XI Tables IWB-2500-1 (Class 1), IWC-2500-1 (Class 2), IWF-2500-1 (Class 1, Class 2), Augmented and Alternate Requirements |
| ID Number | = | Unique Identification Number |
| Inspection Date | = | Date of Examination |
| Inspection Status | = | |
| CLR | = | Clear |
| REC | = | Recordable |
| REP | = | Reportable |
| *Inspection Limited | = | *Reference paragraph 5.2 |
| L | = | Limited |
| - | = | No |
| Geo. Ref. | = | Geometric Reflector (Applies only to UT) |
| N | = | No |
| Y | = | Yes |
| Comments | = | General and/or Detail Description |

B. Items examined by Pressure Testing

| | | |
|------------------|---|---|
| Item Number | = | ASME Section XI Tables IWB-2500-1 (Class 1), IWC-2500-1 (Class 2) |
| Drawing Number | = | Number of the Flow Diagram |
| Examination Date | = | Latest Examination date |
| Condition | = | Partial or Complete test |
| Status | = | Clear, Recordable or Reportable |
| Comments | = | General and/or Detail Description |

5.2 Limited Examinations (90% or Less Examination Coverage)

- A. There were thirteen item numbers inspected for which the greater than 90% examination coverage was not obtained. These item numbers are listed below along with the Request for Relief Number that will be filed for these limited inspections.

| Item Number | Request for Relief Serial Number |
|-------------|----------------------------------|
| | |
| B03.110.002 | 98-001 |
| B03.110.005 | 98-001 |
| B03.110.006 | 98-001 |
| B03.120.002 | 98-001 |
| B03.120.005 | 98-001 |
| B03.120.006 | 98-001 |
| B05.070.007 | 98-001 |
| B05.070.008 | 98-001 |
| B05.130.014 | 98-001 |
| B05.130.015 | 98-001 |
| B09.011.006 | 98-001 |
| B09.031.003 | 98-001 |
| C05.021.011 | 98-001 |
| B08.020.001 | Request For Alternative 99-002 |

DUKE POWER COMPANY
 QUALITY ASSURANCE TECHNICAL SERVICES
 Inservice Inspection Database Management System
 McGuire Unit 1 Inservice Inspection Listing
 Interval 2 Outage 2

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Plant: McGuire Unit 1

| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|--------------|----------------|------------|-------------|--------------|---------|-------------------------------------|
| B01.022.001 | 1RPV 1-446A | 08/30/1994 | CLR | --- | N | |
| B01.022.002 | 1RPV 1-446B | 08/30/1994 | CLR | --- | N | |
| B01.022.003 | 1RPV 1-446C | 08/30/1994 | CLR | --- | N | |
| B02.011.002 | 1PZR-5 | 08/24/1994 | CLR | --- | N | |
| B03.110.002 | 1PZR-12 | 08/24/1994 | CLR | 67.00% | N | Reference Request for Relief 98-001 |
| B03.110.005 | 1PZR-15 | 08/24/1994 | CLR | 67.00% | N | Reference Request for Relief 98-001 |
| B03.110.006 | 1PZR-16 | 08/24/1994 | CLR | 67.00% | N | Reference Request for Relief 98-001 |
| B03.120.002 | 1PZR-12R | 08/24/1994 | CLR | 63.00% | N | Reference Request for Relief 98-001 |
| B03.120.005 | 1PZR-15R | 08/24/1994 | CLR | 63.00% | N | Reference Request for Relief 98-001 |
| B03.120.006 | 1PZR-16R | 08/24/1994 | CLR | 63.00% | N | Reference Request for Relief 98-001 |
| B05.070.007 | 1SGD-INLET-SE | 09/19/1994 | CLR | 48.60% | N | Reference Request for Relief 98-001 |
| B05.070.007A | 1SGD-INLET-SE | 09/19/1994 | CLR | --- | N | |
| B05.070.008 | 1SGD-OUTLET-SE | 09/19/1994 | CLR | 47.30% | N | Reference Request for Relief 98-001 |

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Plant: McGuire Unit 1

| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|--------------|----------------|------------|-------------|--------------|---------|-------------------------------------|
| B05.070.008A | 1SGD-OUTLET-SE | 09/19/1994 | CLR | --- | N | |
| B05.130.014 | 1NC1F-4-2 | 09/19/1994 | CLR | 48.60% | N | Reference Request for Relief 98-001 |
| B05.130.014A | 1NC1F-4-2 | 09/19/1994 | CLR | --- | N | |
| B05.130.015 | 1NC1F-4-3 | 09/19/1994 | CLR | 47.30% | N | Reference Request for Relief 98-001 |
| B05.130.015A | 1NC1F-4-3 | 09/19/1994 | CLR | --- | N | |
| B07.020.001 | 1PZR-MWB | 08/23/1994 | CLR | --- | N | |
| B07.030.001 | 1SGA-MW-X-Y | 09/13/1994 | CLR | --- | N | |
| B07.030.002 | 1SGA-MW-Z-Y | 09/13/1994 | CLR | --- | N | |
| B07.030.007 | 1SGD-MW-X-W | 09/13/1994 | CLR | --- | N | |
| B07.030.008 | 1SGD-MW-Z-W | 09/13/1994 | CLR | --- | N | |
| B07.060.003 | 1RCP-1C-S | 09/06/1994 | CLR | --- | N | |
| B07.060.007 | 1RCP-1C-H | 09/06/1994 | CLR | --- | N | |
| B07.070.001 | 1NC-1 | 08/23/1994 | CLR | --- | N | |

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Plant: McGuire Unit 1

| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|-------------|------------|------------|-------------|--------------|---------|--|
| B07.070.002 | 1NC-2 | 08/30/1994 | CLR | --- | N | |
| B07.070.004 | 1NC-27 | 08/23/1994 | CLR | --- | N | |
| B07.070.007 | 1NC-32B | 08/23/1994 | CLR | --- | N | |
| B07.070.009 | 1NC-34A | 08/23/1994 | CLR | --- | N | |
| B07.070.011 | 1NC-36B | 08/23/1994 | CLR | --- | N | |
| B07.070.064 | 1NI-70 | 08/25/1994 | CLR | --- | N | |
| B07.070.070 | 1NI-93 | 08/25/1994 | CLR | --- | N | |
| B07.070.080 | 1NI-180 | 08/25/1994 | CLR | --- | N | |
| B07.070.081 | 1NI-181 | 08/25/1994 | CLR | --- | N | |
| B07.070.102 | 1NV-14 | 08/25/1994 | CLR | --- | N | |
| B08.020.001 | 1PZR-SKIRT | 09/15/1994 | CLR | 50.00% | N | Request For Alternative 99-002 Reference PIP 0-G99-0198 |
| B08.020.002 | 1PZR-W13A | 09/14/1994 | REP | --- | N | Reference PIP 1M94-1233 |
| B08.020.003 | 1PZR-W13B | 09/14/1994 | REP | --- | N | Reference PIP 1M94-1233 |

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| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|--------------|-------------|------------|-------------|--------------|---------|-------------------------------------|
| B08.020.004 | 1PZR-W13C | 09/06/1994 | CLR | --- | N | |
| B08.020.005 | 1PZR-W13D | 09/06/1994 | CLR | --- | N | |
| B09.011.003 | 1NC-4669-W1 | 08/31/1994 | CLR | --- | N | |
| B09.011.003A | 1NC-4669-W1 | 08/29/1994 | CLR | --- | N | |
| B09.011.004 | 1NC1F-1-5 | 09/01/1994 | CLR | --- | N | |
| B09.011.004A | 1NC1F-1-5 | 08/29/1994 | CLR | --- | N | |
| B09.011.005 | 1NC-4670-W2 | 09/01/1994 | CLR | --- | N | |
| B09.011.005A | 1NC-4670-W2 | 08/29/1994 | CLR | --- | N | |
| B09.011.006 | 1NC1F-1-6 | 08/31/1994 | CLR | 53.55% | N | Reference Request for Relief 98-001 |
| B09.011.006A | 1NC1F-1-6 | 08/29/1994 | CLR | --- | N | |
| B09.011.037 | 1NCP-221-3 | 09/05/1994 | CLR | --- | N | |
| B09.011.037A | 1NCP-221-3 | 09/02/1994 | CLR | --- | N | |
| B09.011.038 | 1NCP-221-2 | 09/05/1994 | CLR | --- | N | |

DUKE POWER COMPANY
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 Interval 2 Outage 2

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Plant: McGuire Unit 1

| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|--------------|------------|------------|-------------|--------------|---------|-------------------------------------|
| B09.011.048 | 1NCP-224-6 | 09/05/1994 | CLR | --- | N | |
| B09.011.048A | 1NCP-224-6 | 09/02/1994 | CLR | --- | N | |
| B09.021.008 | 1NC1F-1356 | 09/19/1994 | CLR | --- | N | |
| B09.021.015 | 1NC1F-1377 | 08/23/1994 | CLR | --- | N | |
| B09.021.202 | 1NV1F-1635 | 09/13/1994 | CLR | --- | N | |
| B09.021.203 | 1NV1F-1636 | 09/13/1994 | CLR | --- | N | |
| B09.031.003 | 1NC47-WN6 | 08/25/1994 | CLR | 49.50% | N | Reference Request for Relief 98-001 |
| B09.031.003A | 1NC47-WN6 | 08/23/1994 | CLR | --- | N | |
| B09.032.010 | 1NC44-WN7 | 08/23/1994 | CLR | --- | N | |
| B09.032.011 | 1NC34-WN8 | 08/23/1994 | CLR | --- | N | |
| B09.032.012 | 1NCP-221-4 | 09/02/1994 | CLR | --- | N | |
| B09.032.013 | 1NCP-222-5 | 09/02/1994 | CLR | --- | N | |
| B09.032.014 | 1NCP-224-7 | 09/02/1994 | CLR | --- | N | |

DUKE ENERGY COMPANY
 QUALITY ASSURANCE TECHNICAL SERVICES
 Inservice Inspection Database Management System
 McGuire Unit 1 Inservice Inspection Listing
 Interval 2 Outage 2

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| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|--------------|------------------|------------|-------------|--------------|---------|---|
| C01.010.100 | 1ASWINJF-1 | 09/15/1994 | CLR | --- | N | |
| C01.010.101 | 1ASWINJF-2 | 09/15/1994 | REC | --- | Y | |
| C01.020.060 | 1SWHX-HD-BSH | 07/20/1994 | CLR | 85.00% | Y | Deleted after issuance of Report (Reference Plan Addenda 1MNS-070) |
| C02.033.001 | 1RHR-1A-INLET | 09/27/1994 | CLR | --- | N | |
| C02.033.002 | 1RHR-1A-OUTLET | 09/27/1994 | CLR | --- | N | |
| C02.033.005 | 1ACSHX-1A-INLET | 07/26/1994 | CLR | --- | N | |
| C02.033.006 | 1ACSHX-1B-OUTLET | 07/26/1994 | CLR | --- | N | |
| C03.020.020 | 1MCA-ND-016 | 09/19/1994 | CLR | --- | N | |
| C03.020.030 | 1MCR-SM-007 | 09/19/1994 | CLR | --- | N | |
| C05.011.009 | 1ND12-1 | 07/19/1994 | CLR | --- | N | |
| C05.011.009A | 1ND12-1 | 07/07/1994 | CLR | --- | N | |
| C05.011.013 | 1ND133-3 | 07/19/1994 | CLR | --- | N | |
| C05.011.013A | 1ND133-3 | 07/11/1994 | CLR | --- | N | |

DUKE POWER COMPANY
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| ITEM NUMBER | ID NUMBER | INSP DATE | INSP STATUS | INSP LIMITED | GEO REF | COMMENTS |
|--------------|------------|------------|-------------|--------------|---------|-------------------------------------|
| C05.012.027 | 1ND75-2L | 07/14/1994 | CLR | --- | N | |
| C05.012.027A | 1ND75-2L | 07/06/1994 | CLR | --- | N | |
| C05.012.029 | 1ND-74-1L | 07/14/1994 | CLR | --- | N | |
| C05.012.029A | 1ND-74-1L | 07/06/1994 | CLR | --- | N | |
| C05.012.030 | 1ND-74-2L | 07/14/1994 | CLR | --- | N | |
| C05.012.030A | 1ND-74-2L | 07/06/1994 | CLR | --- | N | |
| C05.012.049 | 1ND1F-134L | 07/19/1994 | CLR | --- | N | |
| C05.012.049A | 1ND1F-134L | 07/07/1994 | CLR | --- | N | |
| C05.021.011 | 1NI18-1 | 07/27/1994 | CLR | 87.50% | N | Reference Request for Relief 98-001 |
| C05.021.011A | 1NI18-1 | 07/07/1994 | CLR | --- | N | |
| C05.021.012 | 1NI1F-35 | 07/20/1994 | CLR | --- | N | |
| C05.021.012A | 1NI1F-35 | 07/07/1994 | CLR | --- | N | |
| C05.021.013 | 1NI93-4 | 07/28/1994 | CLR | --- | N | |

8.0 Corrective Action

The following are the Problem Investigation Process reports (PIP'S) issued to document items found during Outage 9:

1M94-1233 (Pressurizer Welds 1PZR-W13A, 1PZR-W13B)
B08.20.002, B08.20.003

1M94-1348 (Appendix J Testing) C07.030.012, C07.030.013,
C07.030.019, C07.030.022, C07.030.025

1M94-1467 (Reactor Vessel Interior) B13.010.001

0-G99-0198 (1PZR-SKIRT) B08.020.001

General Office
Problem Investigation Process - PIP
Problem Investigation Form

PIP Serial No: 0-G99-0198
LER No:

Action Category: 3
Other Report:

I. Problem ID

Discovered Time/Date: 07/07/99

Occurred Time/Date:

Unit(s):

Status at Time Discovered

Unit 1

Unit 2

Mode

% Power

Unit Status Remarks:

System(s) Affected:

Affected Equipment

| <u>WMS Equipment ID No.</u> | <u>Comp. Code</u> | <u>Manufacturer</u> |
|-----------------------------|-----------------------|---------------------|
|-----------------------------|-----------------------|---------------------|

Location of Problem - Bldg:

Column Line:

Elev:

Location Remarks:

Method Used to Discover Problem:

Brief Problem Description:

During a comparison of Inservice Inspection examinations between Catawba and McGuire Nuclear Stations, it was discovered that McGuire Unit 1 Pressurizer Support Skirt Weld coverage (Item Number B08.020.001, IPZR-SKIRT) did not agree with Catawba's examination coverage.

Detailed Problem Description:

During McGuire Unit 1 EOC 9 and EOC 10 a Magnetic Particle (MT) exam was performed on the Pressurizer Skirt Support Weld. ASME Section XI Code requires that both ID and OD sides of the weld be examined. During the MT exams only the OD side of the weld was examined. In addition, the incorrect acceptance standards were used for the evaluations. Incorrect examination coverage led to only one side of a two-sided exam being performed. Due to design of the ID area it was impossible to perform MT examinations in this area, however the design problem was never addressed. The exam coverage status was reported as 100% coverage on the MT inspection records, which led to the Inservice Inspection Report reporting the inspection coverage as greater than 90%. Since only one side of the weld was examined, the greater than 90% coverage required by Code Case N-460 was not met.

Entered for Gary Underwood

General Office

Problem Investigation Process - PIP

Problem Investigation Form

| | | |
|----------------|------------|--------------------|
| PIP Serial No: | 0-G99-0198 | Action Category: 3 |
| LER No: | | Other Report: |

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

Other Units/Components/Systems/Areas Affected (Y,N,U): N

Industry Plants Affected (Y,N,U): U

Immediate Corrective Actions:

Problem Found While Working with Document No. :

Immediate Corrective Action Work Request / Work Order No. :

| | | | | |
|------------------------|--------------|-------------|--------------|--------------|
| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date:</u> |
| Problem Identified By: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Problem Entered By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

II. Screening

Is the Problem Significant? N Action Category: 3

OEP No:

Other Report Nos:

Event Codes: A1 Failure to follow procedures/directives/policies

Screening Remarks:

This meets the criteria for a level 3 PIP

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

Responsible Group(s) for Problem Evaluation: QAT QA Tech. Services

Responsible Group for Present Operability: N/A

Responsible Group for Past Operability: N/A

Responsible Group for Reportability: N/A

Responsible Group for Overall PIP approval: QAT QA Tech. Services

| | | | | |
|--------------|--------------|-------------|--------------|-------------|
| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
| Screened By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

General Office

Problem Investigation Process - PIP

Problem Investigation Form

PIP Serial No: 0-G99-0198
LER No:

Action Category: 3
Other Report:

III. Operability

Present Operability:

Responsible Group: Status:

Sys/Comp Operable?(Y,N,C,E) :

Required Mode:

Comments:

Indiv Team Group Date
No current Signatures for this section.

Past Operability:

Responsible Group: Status:

Sys/Comp Operable?(Y,N,C,E) :

Required Mode:

Comments:

Indiv Team Group Date
No current Signatures for this section.

IV. Reportability/Investigation

Responsible Group: Status:

Problem Reportable(Y,N,E):

Reportable Per:

Comments:

Indiv Team Group Date
No current Signatures for this section.

Investigation Report:

General Office

Problem Investigation Process - PIP

Problem Investigation Form

PIP Serial No: 0-G99-0198
LER No:

Action Category: 3
Other Report:

Responsible Group:

Act Date:

Investigator:

Due Date:

Date Due to VP or Sta. Mgr:

Date Regulatory or Agency Rpt Due:

Date Investigation Report Approved:

NRC Cause Codes:

V. Problem Evaluation

System(s) Affected:

Affected Equipment

| <u>WMS Equipment ID No.</u> | <u>Comp. Code</u> | <u>Manufacturer</u> |
|-----------------------------|-----------------------|---------------------|
|-----------------------------|-----------------------|---------------------|

| <u>Event</u> | <u>Cause Cd</u> | <u>Cause Description</u> | <u>Primary</u> | <u>Causing Group(s)</u> |
|--------------|-----------------|-------------------------------|----------------|-------------------------|
| A1 | YYY | Incomplete Problem Evaluation | No | |

Problem Evaluation From: Resp. Group: QAT Status: Open OEDB Checked: No

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|--------------|--------------|-------------|--------------|-------------|
| Due Date: | 08/06/99 | | | |
| Accepted By: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Assigned To: | TLT8302 | KWS8302 | QAT | 07/07/99 |

VII. Corrective Actions

Seq. No: 1

Resp Group: QAT Status: Closed
Orig Group: QAT Event Code: A1
Prop CAC: B3 Cause Code: YYY

Proposed Corrective Action:

Level III MT inspector to evaluate the acceptance standards used to determine if code requirements were met for OD portion of weld.

General Office
Problem Investigation Process - PIP
Problem Investigation Form

| | |
|----------------------------------|---------------------------|
| PIP Serial No: 0-G99-0198 | Action Category: 3 |
| LER No: | Other Report: |

Entered for Gary Underwood

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|-----------------------|--------------|-------------|--------------|-------------|
| Ready For Approval: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approval Assigned To: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approved By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

General:

Outage: Mode:

| Other Tracking Processes | | |
|---------------------------------|---------------|-------------|
| <u>Type</u> | <u>Number</u> | <u>Text</u> |

Actual Corrective Action:

Actual CAC:
Due Date: 10/05/99

Status: Open

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|--------------|--------------|-------------|--------------|-------------|
| Due Date: | 10/05/99 | | | |
| Accepted By: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Assigned To: | TLT8302 | KWS8302 | QAT | 07/07/99 |

| |
|-------------------|
| Seq. No: 2 |
|-------------------|

Resp Group: QAT
Orig Group: QAT
Prop CAC: A2

Status: Closed
Event Code: A1
Cause Code: YYY

Proposed Corrective Action:

File Request for Relief to address the issue of no surface exam coverage for the ID of the Pressurizer Support Skirt Weld.

Entered for Gary Underwood

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|-----------------------|--------------|-------------|--------------|-------------|
| Ready For Approval: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approval Assigned To: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approved By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

General Office

Problem Investigation Process - PIP

Problem Investigation Form

| | | |
|----------------|------------|--------------------|
| PIP Serial No: | 0-G99-0198 | Action Category: 3 |
| LER No: | | Other Report: |

General:

Outage: Mode:

Other Tracking Processes
Type Number Text

Actual Corrective Action:

Actual CAC:
Due Date: 10/05/99

Status: Open

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|--------------|--------------|-------------|--------------|-------------|
| Due Date: | 10/05/99 | | | |
| Accepted By: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Assigned To: | GJU8302 | KWS8302 | QAT | 07/07/99 |

Seq. No: 3

Resp Group: QAT
Orig Group: QAT
Prop CAC: B3

Status: Closed
Event Code: A1
Cause Code: YYY

Proposed Corrective Action:

Level III MT inspector to review process that led to missed ID exam

Entered for Gary Underwood

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|-----------------------|--------------|-------------|--------------|-------------|
| Ready For Approval: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approval Assigned To: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approved By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

General:

Outage: Mode:

Other Tracking Processes
Type Number Text

Actual Corrective Action:

Actual CAC:
Due Date: 10/05/99

Status: Open

General Office
Problem Investigation Process - PIP
Problem Investigation Form

| | |
|----------------------------------|---------------------------|
| PIP Serial No: 0-G99-0198 | Action Category: 3 |
| LER No: | Other Report: |

| | | | | | |
|--------------|----------|-------------|--|--------------|-------------|
| Indiv | | Team | | Group | Date |
| Due Date: | 10/05/99 | | | | |
| Accepted By: | KWS8302 | KWS8302 | | QAT | 07/07/99 |
| Assigned To: | TLT8302 | KWS8302 | | QAT | 07/07/99 |

Seq. No: 4

| | | | |
|-------------|-----|-------------|--------|
| Resp Group: | QAT | Status: | Closed |
| Orig Group: | QAT | Event Code: | A1 |
| Prop CAC: | A3 | Cause Code: | YYY |

Proposed Corrective Action:

Inservice Inspection Group to revise EOC 9 and EOC 10 Reports to address the reporting status

Entered for Gary Underwood

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

| | | | | |
|-----------------------|--------------|-------------|--------------|-------------|
| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
| Ready For Approval: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approval Assigned To: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approved By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

General:

Outage: Mode:

Other Tracking Processes

| | | |
|-------------|---------------|-------------|
| <u>Type</u> | <u>Number</u> | <u>Text</u> |
|-------------|---------------|-------------|

Actual Corrective Action:

Actual CAC:
Due Date: 10/05/99

Status: Open

| | | | | |
|--------------|--------------|-------------|--------------|-------------|
| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
| Due Date: | 10/05/99 | | | |
| Accepted By: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Assigned To: | GJU8302 | KWS8302 | QAT | 07/07/99 |

Seq. No: 5

| | | | |
|-------------|-----|-------------|--------|
| Resp Group: | QAT | Status: | Closed |
| Orig Group: | QAT | Event Code: | A1 |
| Prop CAC: | B3 | Cause Code: | YYY |

General Office

Problem Investigation Process - PIP

Problem Investigation Form

PIP Serial No: 0-G99-0198
LER No:

Action Category: 3
Other Report:

Proposed Corrective Action:

Level III UT inspector to evaluate the feasibility of performing UT exam on the ID surface of the subject weld in lieu of the required MT exam.

Entered for Gary Underwood

Originated By: KWS8302: SCHMIDT, KENNETH W Team: KWS8302 Group: QAT Date: 07/07/99

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|-----------------------|--------------|-------------|--------------|-------------|
| Ready For Approval: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approval Assigned To: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Approved By: | KWS8302 | KWS8302 | QAT | 07/07/99 |

General:

Outage: Mode:

Other Tracking Processes
Type Number Text

Actual Corrective Action:

Actual CAC:
Due Date: 10/05/99

Status: Open

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|--------------|--------------|-------------|--------------|-------------|
| Due Date: | 10/05/99 | | | |
| Accepted By: | KWS8302 | KWS8302 | QAT | 07/07/99 |
| Assigned To: | JJM0948 | KWS8302 | QAT | 07/07/99 |

VIII. Final and Overall PIP Approval

Responsible Group: QAT Status: Screened

| | <u>Indiv</u> | <u>Team</u> | <u>Group</u> | <u>Date</u> |
|--------------|--------------|-------------|--------------|-------------|
| Assigned To: | | | QAT | 07/07/99 |

Closure Document Type

Closure Document No

Supplemental Concurrences - These do not affect PIP closure.

General Office
Problem Investigation Process - PIP
Problem Investigation Form

PIP Serial No: 0-G99-0198
LER No:

Action Category: 3
Other Report:

Concurrences Associated with External Commitments:

Concurred By: Indiv Team Group Date

IX. Attachments

Generic Applicability

Generic Applicability Review Not Required for this PIP.

Environmental

No Environmental for this PIP.

Failure Prevention Investigation:

No FPI for this PIP.

Remarks

No Remarks for this PIP

Maintenance Rule

No Maintenance Rule for this PIP

End of the Document for PIP No: 0-G99-0198
The status of this PIP is: Screened
The duration of this PIP was: 0 days

9.0 Reference Documents

The following reference documents apply to the inservice inspection performed during Outage 9 at McGuire Unit 1:

- (1) Request for Relief (94-010)
- (2) Request for Relief (94-006)
- (3) Request for Relief (94-GO-002)
- (4) Request for Relief (98-001)
- (5) Request for Alternative (99-002)

Duke Energy Corporation

Station McGuire Unit 1 & 2SECOND 10-YEAR INTERVAL REQUEST FOR ALTERNATIVE NO. 99-002

Pursuant to 10CFR50.55a (a)(3) (i & ii), Duke Energy Corporation requests the use of an alternative to the ASME Boiler and Pressure Vessel Code Section XI for McGuire Units 1 and 2. Specifically, Duke Energy requests approval to use the provisions of Code Case N-323-1, "Alternative Examination for Welded Attachments to Pressure Vessels Section XI, Division 1." This Code Case has not been listed in the latest published revision (Revision 12) of NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." A copy of Code Case N-323-1 is included for your information as Attachment 1 of the Request for Alternative.

The Code Case states: (a) "for the configuration shown in Figs. 1 and 2, a surface examination from the accessible side of the attachment weld may be performed." Utilization of the above Code Case would alleviate the need to do the inside surface of the support skirt weld. The inside surface of this weld has insufficient clearance to permit the required surface examination.

I. System / Component(s) for Which the Alternative is Requested:

Safety-related ASME Section XI Code Class 1 Pressurizer Integrally Welded Attachments (Pressurizer Support Skirt to Lower Head.)

McGuire 1

| Item Number | ID Number | Description |
|-------------|------------|---|
| B08.020.001 | 1PZR-SKIRT | Pressurizer Support Skirt to Lower Head |

McGuire 2

| Item Number | ID Number | Description |
|-------------|------------|---|
| B08.020.001 | 2PZR-SKIRT | Pressurizer Support Skirt to Lower Head |

II. Code Requirement:

It is required by the 1989 ASME Boiler and Pressure Vessel Section XI Code (no addenda) that the surface of Class A Pressurizer Integrally Welded Attachments, Table IWB-2500-1, Examination Category B-H, Item Number B8.20 be examined per Examination Requirements IWB-2500-13, 14 and 15.

III. Code Requirement for which the Alternative is Requested:

ASME Boiler and Pressure Vessel Code Section XI, 1989 Edition (no addenda), Table IWB-2500-1 Examination Category B-H, Item No. B8.20, Figure No. IWB-2500-13. Examination Requirements Figure Number IWB-2500-13 requires a surface examination to areas (A-B) and (C-D). And Note 2 which states "The extent of the examination includes essentially 100% of the length of the attachment weld at each attachment subject to examination.

IV. Basis for Alternative Examination

Duke Energy request approval of Code Case N-323-1 and proposes to apply it as an alternative to the rules for surface examination of the Pressurizer Support Skirt to Lower Head Weld specified in Table IWB-2500-1, Examination Category B-H, Item Number B8.20. Code Case N-323-1 (a) allows " for the configuration shown in Figs. 1 and 2, a surface examination from the accessible side of the attachment weld may be performed". Figure 1 shows the surface examination areas to be (A-B) or (C-D).

V. Alternate Examination or Testing:

The OD surface (surface area A-B) of the weld will be examined by magnetic particle testing. The ID surface (surface area C-D) of the weld will not be examined.

VI. Justification for the Granting of Relief:

There is inadequate accessibility of the inside surface (surface C-D) of the Pressurizer Support Skirt Weld to perform the required surface examination.

VII. Implementation Schedule:

The weld will be scheduled in accordance with ASME Section XI requirements as shown in the McGuire Nuclear Station Inservice Inspection Plan Second Ten Year Interval for Unit 1 & Unit 2.

The following individuals contributed to the development of this RFA. Gary Underwood (Plan Manager McGuire) sections I-VII, Mark Pyne (Nuclear G.O. Engineering) review, Kevin Rhyne (Nuclear G.O. Supervising Engineer) final review.

Sponsored By: Gary Underwood Date 9/20/99

Approved By: K. Kevin Rhyne Date 9/20/99

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: December 31, 1996

*See Numerical Index for expiration
and any reaffirmation dates.*

Case N-323-1

**Alternative Examination for Welded Attachments
to Pressure Vessels**

Section XI, Division 1

Inquiry: What alternative to the requirements of Examination Category B-K of the 1995 Addenda or Examination Category B-H from the Winter 1991 Addenda, through the 1995 Edition may be performed for welded attachments to pressure vessels as shown in Figs. 1 and 2 when only one side of the attachment weld is accessible for examination?

Reply: It is the opinion of the Committee that as an alternative to the requirements of Examination Category B-K of the 1995 Addenda or Examination Category B-H from Winter 1991 Addenda to the 1995 Edition:

(a) for the configuration shown in Figs. 1 and 2, a surface examination from the accessible side of the attachment weld may be performed or;

(b) for the configuration shown in Fig. 2, a volumetric examination of Volume A-B, C-D from the accessible side of the attachment weld may be performed.

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

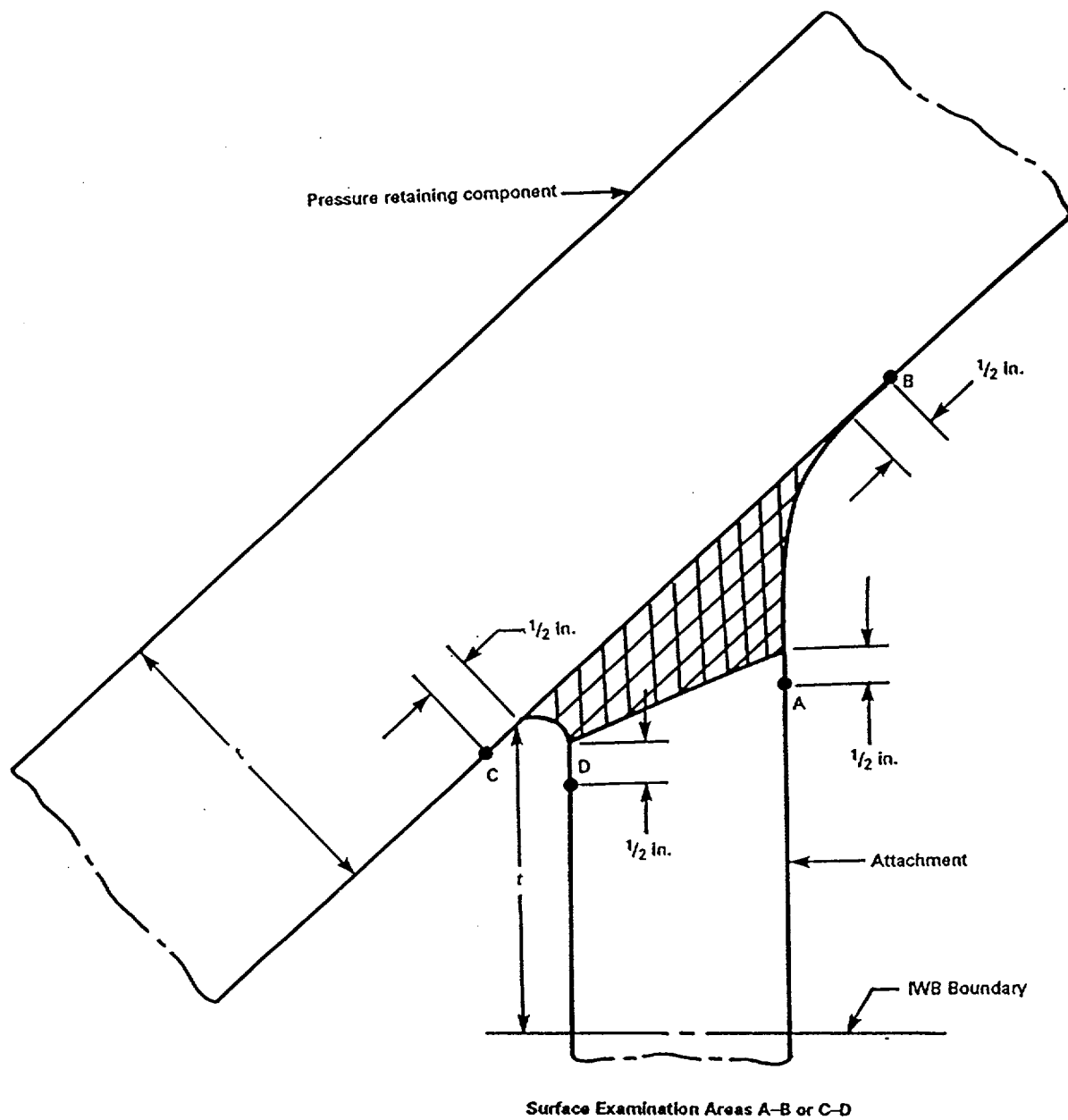
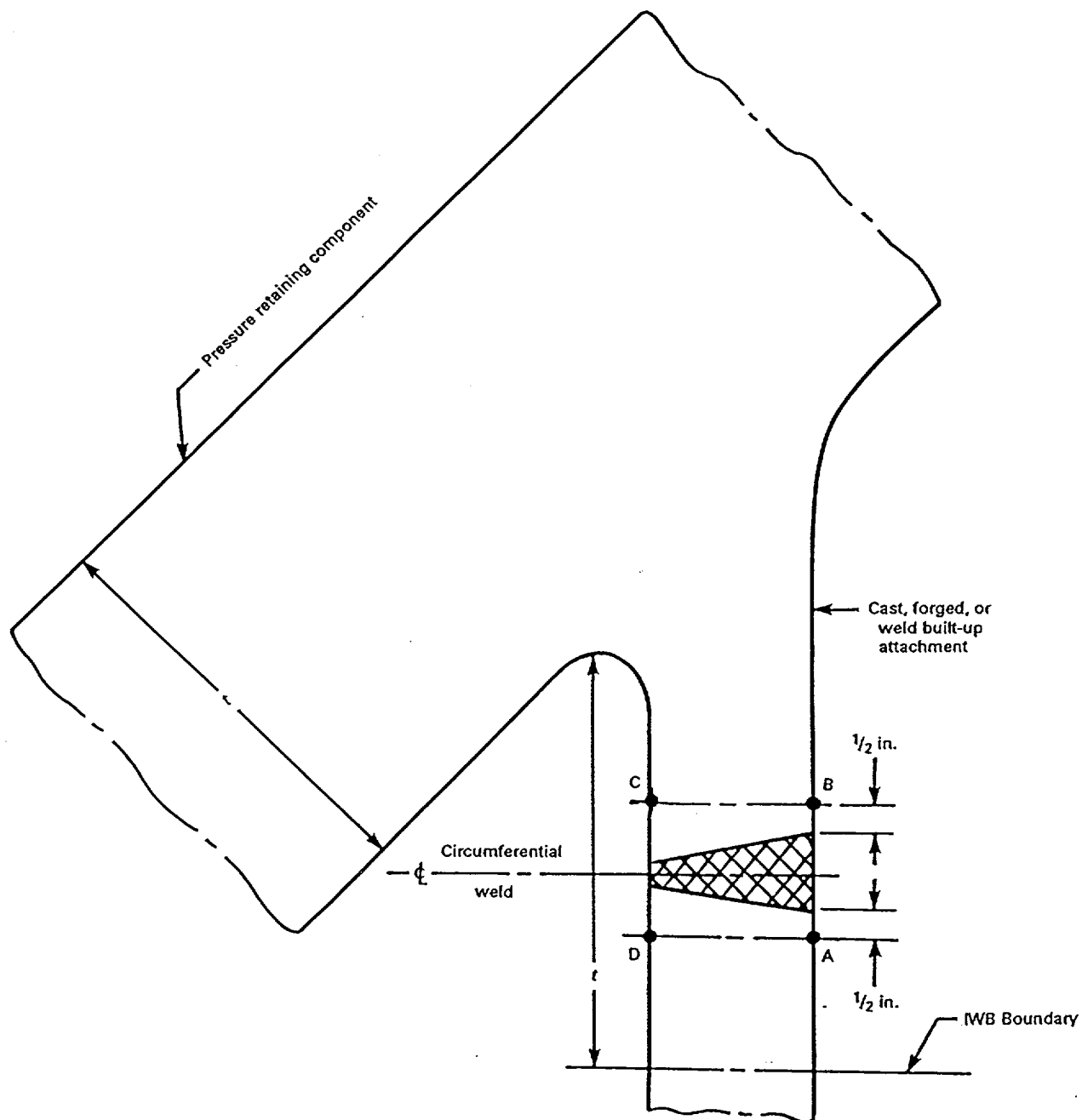


FIG. 1 WELDED ATTACHMENT

CASES OF ASME BOILER AND PRESSURE VESSEL CODE



Surface Examination Areas A-B or C-D

FIG. 2 WELDED ATTACHMENT

Duke Energy Corporation

Station McGuire Unit 1**SECOND 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 98-001**

Pursuant to 10CFR50.55a (g) (5) (iii), Duke Energy Corporation has determined that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Conformance with examination requirements of ASME Section XI is not practical for McGuire Nuclear Station Unit 1. Information is therefore being submitted in support of this determination and request is being sought for relief from the applicable ASME Section XI requirements (s).

I. System / Components(s) for Which Relief is Requested:**ASME Section XI Class 1 Components listed below:****Examination Category B-A: (Pressure Retaining Welds in Reactor Vessel)**

Flange to Upper Shell Weld

| <u>ID Numbers</u> | <u>Item Numbers</u> | <u>End Of Cycle</u> |
|-------------------|---------------------|---------------------|
| 1RPV7-442 | B01.030.001 | 8 |

Examination Category B-D: (Full Penetration Welds of Nozzles in Vessels)

Reactor Vessel (Nozzle-to-Vessel Welds)

| <u>ID Numbers</u> | <u>Item Numbers</u> | <u>End Of Cycle</u> |
|-------------------|---------------------|---------------------|
| 1RPV5-445E | B03.090.005A | 8 |
| 1RPV5-445F | B03.090.006A | 8 |
| 1RPV5-445G | B03.090.007A | 8 |
| 1RPV5-445H | B03.090.008A | 8 |

Reactor Vessel (Nozzle Inside Radius Section)

| <u>ID Numbers</u> | <u>Item Numbers</u> | <u>End Of Cycle</u> |
|-------------------|---------------------|---------------------|
| 1RPV5-445ER | B03.100.005 | 8 |
| 1RPV5-445FR | B03.100.006 | 8 |
| 1RPV5-445GR | B03.100.007 | 8 |
| 1RPV5-445HR | B03.100.008 | 8 |

ASME Section XI Class 2 Components listed below:

Examination Category C-A: (Pressure Retaining Welds in Pressure Vessels)

Tubesheet-to-Shell Weld

| <u>ID Numbers</u> | <u>Item Numbers</u> | <u>End Of Cycle</u> |
|-------------------|---------------------|---------------------|
| 1SGA-02-03 | C01.030.001 | 8 |

Examination Category C-F-1: (Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping)

Circumferential Weld

| <u>ID Numbers</u> | <u>Item Numbers</u> | <u>End Of Cycle</u> |
|-------------------|---------------------|---------------------|
| 1NI18-1 | C05.021.011 | 9 |

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1986 Edition; Table IWB-2500 and IWC-2500, lists the following requirements for each Examination Category as shown below:

“Examination Category B-A, Pressure Retaining Welds in Reactor Vessels; Figure Number IWB-2500-4”

Note (2) adds the words “Includes essentially 100% of weld length.”

“Examination Category B-D, Full Penetration Welds of Nozzles in Vessels-Inspection Program B; Figure Number IWB-2500-7 (a) through (d)”

“Examination Category B-F, Pressure Retaining Dissimilar Metal Welds; Figure Number IWB-2500-8”

“Examination Category B-J, Pressure Retaining Welds in Piping; Figure Number IWB-2500-8, 9, 10 and 11”

Note (3) adds the words “Includes essentially 100% of weld length.”

“Examination Category C-A, Pressure Retaining Welds in Pressure Vessels; Figure Number IWC-2500-2”

Note (1) adds the words “Includes essentially 100% of the weld length.”

“Examination Category C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping”; Figure Number IWC-2500-7 requires “100% of each weld requiring examination.”

Note: Duke Energy Corporation with NRC approval has adopted Code Case N-460 which defines “essentially 100%” as greater than 90% coverage.

III. Code Requirement from which Relief is Requested:

Relief is requested from the requirement of examining essentially 100% of the weld length. Due to part geometry and actual physical barriers, obtaining greater than 90% of the weld volume as outlined in Code Case N-460, which is utilized by Duke Energy, is not possible.

ASME Section XI Class 1 Components listed below:**Examination Category B-A**

Reactor Vessel Flange to Upper Shell Weld

Item Numbers

B01.030.001 See Note 1R

Examination Category B-D

Reactor Vessel (Nozzle-to-Vessel Welds)

Item Numbers

B03.090.005A See Note 1R

B03.090.006A See Note 1R

B03.090.007A See Note 1R

B03.090.008A See Note 1R

Reactor Vessel (Nozzle Inside Radius Section)

Item Numbers

B03.100.005 See Note 1R

B03.100.006 See Note 1R

B03.100.007 See Note 1R

B03.100.008 See Note 1R

Pressurizer (Nozzle-to-Vessel Welds)

Item Numbers

B03.110.002 See Note 1R

B03.110.005 See Note 1R

B03.110.006 See Note 1R

Note 1R

ASME Section V, Article 4, T-441.3.2 Scanning Requirements, 1986 Edition with no addenda as modified by Code Case N-460.

This paragraph requires scanning of the examination volume(s) using two angle beams and a straight beam from both sides of the weld.

When scanning for reflectors parallel to the weld, the angle beams shall be aimed at right angles to the weld axis, with the search unit(s) manipulated so that the ultrasonic beams pass through the entire volume of weld metal. The adjacent base metal in the examination volume must be completely scanned by two angle beams, but need not be completely scanned by both angle beams from both directions (any combination of two angle beams will satisfy the requirement).

When scanning for reflectors transverse to the weld, the angle beam units shall be aimed parallel to the axis of longitudinal and circumferential welds. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume. Scanning shall be done in two directions 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

Code Case N-460 allows for full volume coverage if it can be shown that greater than 90% of the required volume has been examined.

Pressurizer (Nozzle Inside Radius Section)

Item Numbers

| | |
|-------------|--------------------|
| B03.120.002 | SEE NOTE 2R |
| B03.120.005 | SEE NOTE 2R |
| B03.120.006 | SEE NOTE 2R |

NOTE 2R

ASME Section XI, 1986 Edition, Examination Volume shown in Figure IWB-2500-7(b)

Examination Category B-F

Steam Generator (Nozzle to Safe End Butt Welds)

| | |
|-------------|--------------------|
| B05.070.007 | SEE NOTE 3R |
| B05.070.008 | SEE NOTE 3R |

Piping

| | |
|-------------|--------------------|
| B05.130.014 | SEE NOTE 3R |
| B05.130.015 | SEE NOTE 3R |

Examination Category B-J

Circumferential Welds

| | |
|-------------|--------------------|
| B09.011.006 | SEE NOTE 3R |
| B09.011.033 | SEE NOTE 3R |
| B09.011.036 | SEE NOTE 3R |

Examination Category B-J (continued)

B09.011.040 **SEE NOTE 3R**
B09.011.047 **SEE NOTE 3R**
B09.011.066 **SEE NOTE 3R**

Branch Pipe Connection Welds

B09.031.001 **SEE NOTE 3R**
B09.031.002 **SEE NOTE 3R**
B09.031.003 **SEE NOTE 3R**

NOTE 3R

ASME Section XI, Appendix III, Paragraph III-4420, 1986 Edition with no addenda as modified by Code Case N-460. "The examination shall be performed using a sufficiently long examination beam path to provide coverage of the required examination volume in two beam path directions. The examination shall be performed from two sides of the weld, where practicable, or from one side of the weld, as a minimum."

Code Case N-460 allows credit for full volume coverage if it can be shown that greater than 90% of the required weld volume has been examined.

ASME Section XI Class 2 Components listed below:**Examination Category C-A****Tubesheet- to- Shell Weld**

C01.030.001 **SEE NOTE 4R**

NOTE 4R

ASME Section V, Article 4, T-441.3.2 Scanning Requirements, 1986 with no addenda as modified by Code Case N-460.

This Paragraph requires scanning of the examination volume(s) using two angle beams and a straight beam from both sides of the weld.

When scanning for reflectors parallel to the weld, the angle beams shall be aimed at right angles to the weld axis, with the search unit(s) manipulated so that the ultrasonic beams pass through the entire volume of weld metal. The adjacent base metal in the examination volume must be completely scanned by two angle beams, but need not be completely scanned by both angle beams from both directions (any combination of two angle beams will satisfy the requirement).

When scanning for reflectors transverse to the weld, the angle beam search units shall be aimed parallel to the axis of longitudinal and circumferential welds.

The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume. Scanning shall be done in two directions 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

Code Case N-460 allows credit for full volume coverage if it can be shown that greater than 90% of the required volume has been examined.

Examination Category C-F-1

Circumferential Weld

C05.021.011

SEE NOTE 5R

NOTE 5R

ASME Section XI, Appendix III, Paragraph III-4420, 1986 Edition with no addenda as modified by Code Case N-460. The examination shall be performed using a sufficiently long examination beam path to provide coverage of the required examination volume in two-beam path directions. The examination shall be performed from two sides of the weld, where practicable, or from one side of the weld, as a minimum.

Code Case N-460 allows credit for full volume coverage if it can be shown that greater than 90% of the required volume has been examined.

IV. Basis for Relief:

ASME Section XI Class 1 Components listed below:

Examination Category B-A, Item B1.30, Pressure Retaining Welds in Reactor Vessel

During the ultrasonic examination of the Reactor Vessel Flange to Upper Shell Weld 1RPV7-442 (Item Number B01.030.001) shown in Attachment 1 and 2, coverage of required examination volume could not be obtained. The examination coverage when scanning from the flange seal surface was limited to 57.41%. Limitations were caused by the proximity of stud holes. Since this examination was performed, Duke Energy has modified the ultrasonic procedure to achieve greater than 90% coverage of the required volume.

Examination Category B-D, Items B3.90., B3.100., B3.110., B3.120., Full Penetration Welds of Nozzles in Vessels

During the ultrasonic examination of the Reactor Vessel Outlet Nozzle to Shell Welds

1RPV5-445E (Item Number B03.090.005A)

1RPV5-445F (Item Number B03.090.006A)

1RPV5-445G (Item Number B03.090.007A)

1RPV5-445H (Item Number B03.090.008A)

shown in Attachment 1 and 2, coverage of the required examination volume was limited to 43%. Limitations caused by the nozzle geometry, i.e. the nozzle taper prevented obtaining greater than 90% coverage. In order to achieve additional coverage, the nozzle would have to be re-designed to eliminate the taper.

During the ultrasonic examination of the Reactor Vessel Outlet Nozzle to Shell Welds (Inside Radius Sections)

1RPV5-445ER (Item Number B03.100.005)

1RPV5-445FR (Item Number B03.100.006)

1RPV5-445GR (Item Number B03.100.007)

1RPV5-445HR (Item Number B03.100.008)

shown in Attachment 1 and 2, coverage of the required examination volume was limited to 74%. Limitations caused by the nozzle geometry, i.e. the nozzle taper prevented obtaining greater than 90% coverage. In order to achieve additional coverage, the nozzle would have to be re-designed to eliminate the taper.

During the ultrasonic examination of the Pressurizer Nozzle to Upper Head Welds

1PZR-12 (Item Number B03.110.002)

1PZR-15 (Item Number B03.110.005)

1PZR-16 (Item Number B03.110.006)

shown in Attachment 1 and 3, coverage of the required examination volume could not be obtained. The examination coverage was limited to 67%, due to single sided access caused by the nozzles geometry. In order to achieve more coverage, the nozzles would have to be redesigned to allow access from both sides.

Examination Category B-D **continued**

During the ultrasonic examination of the Pressurizer Nozzle to Upper Head Welds (Inside Radius Sections)

1PZR-12R (Item Number B03.120.002)

1PZR-15R (Item Number B03.120.005)

1PZR-16R (Item Number B03.120.006)

shown in Attachment 1 and 3, coverage of the required examination volume could not be obtained. The examination coverage was limited to 63%, limitations are caused by the ratio of the nozzle O.D. to the vessel thickness. When the nozzle O.D. is large in relation to the vessel thickness, less coverage can be obtained when scanning from the vessel side. **See Note 6R**

Note 6R Items B03.120.002, B03.120.005 and B03.120.006

Examinations from the nozzle boss and O.D. blend radius using compound angles, determining which angles to use, metal paths to calibrate for and area of coverage is not accurate with manual calculations. Duke Energy Corporation is investigating the use of computer modeling to solve the limitation problems.

Examination Category B-F, Items B5.70., B5.130. Pressure Retaining Dissimilar Metal Welds

Note: These welds were cut out and re-welded due to Steam Generator Replacement

During the ultrasonic examination of the Steam Generator 1D Inlet Nozzle Safe End Weld 1SGD-INLET- SE (B05.070.007) shown in Attachment 1 and 4, coverage of the required examination volume could not be obtained. The examination coverage was limited to 48.60%. **SEE NOTE 7R**

During the ultrasonic examination of the Steam Generator 1D Outlet Nozzle Safe End Weld 1SGD-OUTLET- SE (B05.070.008) shown in Attachment 1 and 5, coverage of the required examination volume could not be obtained. The examination coverage was limited to 47.30%. **SEE NOTE 7R**

During the ultrasonic examination of the Steam Generator 1D Inlet Nozzle Safe End to Pipe Weld INC1F-4-2 (B05.130.014) shown in Attachment 1 and 4, coverage of the required examination volume could not be obtained. The examination coverage was limited to 48.60%. **SEE NOTE 7R**

During the ultrasonic examination of the Steam Generator 1D Outlet Nozzle Safe End to Pipe Weld INC1F-4-3 (B05.130.015) shown in Attachment 1 and 5, coverage of the required examination volume could not be obtained. The examination coverage was limited to 47.30%. **SEE NOTE 7R**

NOTE 7R Items B05.070.007, B05.070.008, B05.130.014 and B05.130.015

Material characteristics and single sided access caused by the component geometry prevents two beam path direction coverage of the examination volume.

The most effective ultrasonic technique for the examination of dissimilar metal welds uses refracted longitudinal waves. The longitudinal wave is preferred as the austenitic weld metal and buttering *when present* create highly attenuative barriers to shear wave ultrasound. The longitudinal wave is less affected by these difficulties. However, the longitudinal wave is affected by mode conversion when it strikes the inside surface of the safe end or pipe at any angle other than a right angle to the surface.

The calculations below shows that a 45° refracted longitudinal wave striking the inside surface of a pipe will produce a 22.9° refracted shear wave in addition to the normally expected 45° reflected longitudinal wave.

$$\begin{aligned}\sin^{-1} &= (\sin 45^\circ \times V_s) \div V_L \\ &= (0.707 \times 0.123) \div 0.223\end{aligned}$$

Where: \sin^{-1} is the shear wave angle

V_s is the shear wave velocity of the stainless steel safe end/pipe material in inches/ μ sec.

V_L is the longitudinal wave velocity of the stainless steel safe/pipe end material in inches/ μ sec.

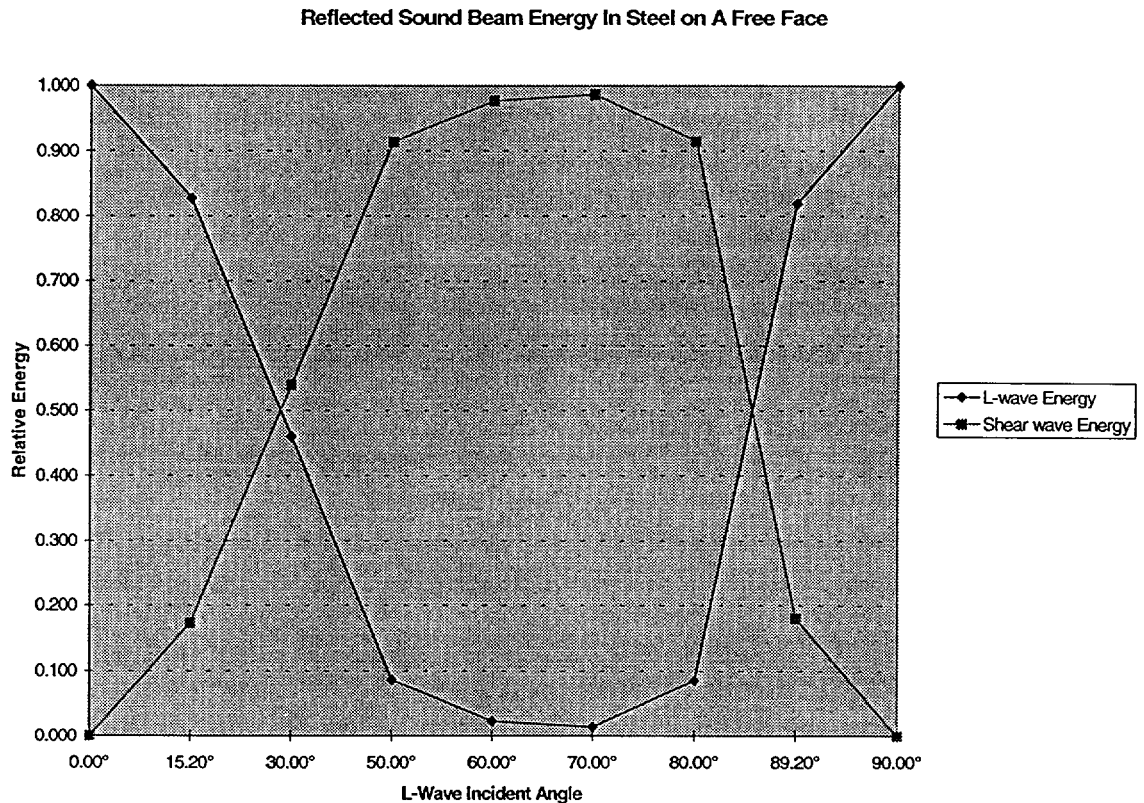
As shown in the graph below, the mode conversion process creates two sound beams of differing intensities reflecting off of the inside surface.¹ At incident angles greater than 30° the shear wave will predominate. However, the shear wave is attenuated and scattered by the austenitic weld metal and the layer of buttering. The examination sensitivity is degraded to such an extent that any examination using the second sound path leg is meaningless. Therefore, the two beam path direction coverage requirement is impractical.

In order to obtain the required two beam path direction coverage, welds would have to be re-designed to allow scanning from both sides.

¹ Firestone, F. A. : Tricks with the Supersonic Reflectoscope, *J. Soc. Nondestructive Testing*, vol. 7, no. 2 Fall 1948.

Note 7R

continued



Examination Category B-J, Items B9.11, B9.31, Pressure Retaining Welds in Piping

During the ultrasonic examination of the Reactor Coolant Pump 1A to Pipe, Weld Number 1NC1F-1-6, (B09.011.006) shown in Attachment 1 and 6, coverage of the required examination volume was limited to 53.55%, due to single sided access caused by the elbow to pump geometry which prevented scanning from both sides of the weld.

During the ultrasonic examination of the Nozzle to Elbow Weld, Number 1NC1F-1850, (B09.011.033) shown in Attachment 1 and 7, coverage of the required examination volume was limited to 81.94%. No scan could be performed from the nozzle side of the weld due to the nozzle transition.

During the ultrasonic examination of the Pipe to Elbow, Weld Number 1NC1F-539, (B09.011.036) shown in Attachment 1 and 8, coverage of the required examination volume was limited to 78.00%. This scan was limited due to diametric shrinkage on the pipe side of the weld. In order to obtain greater than 90% coverage, the base metal adjacent to the weld would have to be built up with the addition of weld metal to improve the transition.

During the ultrasonic examination of the Nozzle to Elbow Circumferential Weld, Weld Number 1NC1F-542, (B09.011.040) shown in Attachment 1 and 9, coverage of the required examination volume could not be obtained. The examination coverage was limited to 77.50%. No scan could be performed from the nozzle due to the nozzle transition.

During the ultrasonic examination of the Nozzle to Elbow Weld. Number 1NC1F-544, (B09.011.047) shown in Attachment 1 and 10, coverage of the required examination volume could not be obtained. The examination coverage was limited to 90.00%. No scan could be performed from the nozzle due to the nozzle transition.

During the ultrasonic examination of the Nozzle to Elbow Weld, Number 1NC1F-1746, (B09.011.066) shown in Attachment 1 and 11, coverage of the required examination volume could not be obtained. The examination coverage was limited to 53.00%. No scan could be performed from the nozzle due to the nozzle transition.

During the ultrasonic examination of the Pipe to Nozzle Branch Connection Weld, Weld Number 1NC47-WN4A, (B09.031.001) shown in Attachment 1 and 12, coverage of the required examination volume could not be obtained. The examination coverage was limited to 49.50%. Single sided access caused by the branch connection geometry prevents scanning from both sides of the weld.

During the ultrasonic examination of the Pipe to Nozzle Branch Connection Weld, Weld Number 1NC47-WN4B (B09.031.002) shown in Attachment 1 and 13, coverage of the required examination volume could not be obtained. The examination coverage was limited to 48.20%. Single sided access caused by the branch connection geometry prevents scanning from both sides of the weld.

During the ultrasonic examination of the Pipe to Nozzle Branch Connection Weld, Weld Number 1NC47-WN6 (B09.031.003) shown in Attachment 1 and 14, coverage of the required examination volume could not be obtained. The examination coverage was limited to 49.50%. Single sided access caused by the branch connection geometry prevents scanning from both sides of the weld.

Examination Category B-J continued

In all cases of austenitic welds with single sided access, the stainless steel characteristics mandate the use of refracted longitudinal waves. This type of ultrasonic wave produces mode conversion at the pipe inside surface, thus preventing the use of sound path distances beyond the first "leg". Therefore, coverage of the required examination volume in two-beam path directions is not practical.

In order to obtain the required two beam path direction coverage, the branch connections and the elbow to pump weld would have to be re-designed to allow scanning from both sides of the weld.

ASME Section XI Class 2 Components listed below:**Examination Category C-A, Items C1.30 Pressure Retaining Welds in Pressure Vessels**

NOTE : THIS WELD AND GENERATOR HAVE BEEN REPLACED

During the ultrasonic examination of the Tubesheet to Stub Barrel Weld 1SGA-02-03 (C01.030.001) shown in Attachment 1 and 15, coverage of the required examination volume was limited to 86.57%, limited scanning area was caused by the proximity of inspection ports and branch connection piping. In order to achieve more coverage these obstructions would have to be moved away from the weld.

Examination Category C-F-1, Items C5.21 Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

During the ultrasonic examination of the Pipe to Flange Weld 1NI18-1 (C05.021.011) shown in Attachment 1 and 16, coverage of the required examination volume was limited to 87.50%, due to single sided access caused by the pipe to flange geometry preventing scanning from both sides of the weld.

The stainless steel characteristics of the weld mandate the use of refracted longitudinal waves to examine the weld metal and the far side base material. This type of ultrasonic wave produces mode conversion at the pipe inside surface, thus preventing the use of sound path distances beyond the first "leg". Therefore, coverage of the required examination volume in two-beam path directions is not practical. See additional technical discussion in Note 7R.

V. Alternate Examinations or Testing:

The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

Since radiography is impractical, Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practicable 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 the request.

For the Class 1 Components listed in Section I above, Duke Energy proposes to use the pressure test to compliment the limited examination coverage. The Code requires (reference Table IWB-2500-1, Item Number B15.) that a system leakage test be performed after each refueling outage. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number B15.) is required once during each 10-year inspection interval. These tests require a VT-2 visual examination for evidence of leakage. This testing will provide adequate assurance of pressure boundary integrity.

For the Class 2 Components listed in Section I above, Duke Energy proposes to use the pressure test to compliment the limited examination coverage. The Code requires (reference Table IWC-2500-1, Item Number C7.) that a system pressure test be performed once each period. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number C7.) is required once during each 10-year inspection interval. These tests require a VT-2 visual examination for evidence of leakage. This testing will provide adequate assurance of pressure boundary integrity.

VI. Justification for the Granting of Relief

ASME Section XI Class 1 Components listed below:

Examination Category B-A, Item B1.30, Pressure Retaining Welds in Reactor Vessel

The Reactor Vessel Flange to Upper Shell Weld (1RPV7-442) (Item Number B01.030.001). This weld joins the reactor vessel flange to the upper shell (nozzle belt). The principal limitation for this weld is the stud holes for the

reactor head that limits the scanning area. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. Reference Attachment 2 for scan coverage.

Although the examination volume requirements as defined in ASME Section XI 1986 Edition, Figure IWB-2500-4 could not be met, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity.

The Reactor Pressure Vessel (RPV) Flange to Upper Shell (Weld Number 1RPV7-442) is by definition not in the beltline area of the RPV; therefore, it is not subject to fluence levels equal to or greater than 1 E7 n/cm^2 . RPV materials not in the highly irradiated beltline region are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. Based upon 10 CFR 50.55a, the ASME Code Section XI 1986 Edition requires essentially 100% RPV weld volumetric examinations of beltline welds during every inspection interval. The RPV Flange to Upper Shell Weld does not meet the requirements of a beltline weld due to a significantly lower fluence exposure, resulting in far less potential degradation of ductility. The McGuire Nuclear Station Unit 1 RPV was fabricated by the Combustion Engineering Company and is free from unacceptable fabrication defects. Combustion Engineering performed rigorous state-of-the-art RPV inspections following fabrication to ensure no significant flaws existed.

The flange to upper shell configuration and location of the stud holes in the proximity of the RPV Flange to Upper Shell Weld prevents obtaining 100% volumetric examination coverage; therefore, the 100% examinations are impractical. Elimination of the stud holes and/or ultrasonic examination from the inside surface of the head are not viable alternatives and would create an undue burden on Duke Energy Corporation.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the Reactor Vessel Flange to Upper Shell Weld will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Examination Category B-D, Items B3.90., B3.100., B3.110., B3.120., Full Penetration Welds of Nozzles in Vessels

The Reactor Vessel (Nozzle to Vessel Welds) at 22, 158, 202 and 338 degrees are:

1RPV5-445E (Item Numbers B03.090.005A),

1RPV5-445F (Item Numbers B03.090.006A),
1RPV5-445G (Item Numbers B03.090.007A), and
1RPV5-445H (Item Numbers B03.090.008A). The four Outlet Nozzle to Shell Welds were limited due to the reactor vessel nozzle configuration. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference drawing 1213930D (Attachment 2) for scan coverage.

The Reactor Vessel (Nozzle Inside Radius Sections) are:
1RPV5-445ER (Item Numbers B03.100.005),
1RPV5-445FR (Item Numbers B03.100.006),
1RPV5-445GR (Item Numbers B03.100.007), and
1RPV5-445HR (Item Numbers B03.100.008). These four Outlet Nozzle Inner Radius Sections are limited due to the reactor vessel nozzle configuration. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference drawing 1213930D (Attachment 2) for scan coverage.

The Pressurizer (Nozzle to Vessel Welds) are:
1PZR-12 (Item Number B03.110.002),
1PZR-15 (Item Number B03.110.005), and
1PZR-16 (Item Number B03.110.006). These three Pressurizer Nozzle to Upper Head Welds are limited due to single sided access caused by the nozzles geometry. In order to achieve more coverage, the nozzles would have to be redesigned to allow access from both sides. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference Attachment 3 for scan coverage.

The Pressurizer (Nozzle Inside Radius Sections) are:
1PZR-12R (Item Number B03.120.002),
1PZR-15R (Item Number B03.120.005), and
1PZR-16R (Item Number B03.120.006). These three Pressurizer Nozzle to Upper Head Welds (Inside Radius Sections) are limited due to the ratio of the nozzle O.D. to the vessel thickness. When the nozzle O.D. is large in relation to the vessel thickness, less coverage can be obtained when scanning from the vessel side. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques

were utilized to obtain the maximum possible coverage. Reference Attachment 3 for scan coverage.

Although the examination volume requirements as defined in ASME Section XI 1986 Edition, Figure IWB-2500-7 could not be met, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity.

The Reactor Pressure Vessel (RPV) Outlet Nozzle to Shell Welds (Weld Numbers 1RPV5-445E, 1RPV5-445F, 1RPV5-445G, 1RPV5-445H, and Numbers 1RPV5-445ER, 1RPV5-445FR, 1RPV5-445GR, 1RPV5-445HR) are by definition not in the beltline area of the RPV; therefore, it is not subject to fluence levels equal to or greater than 1 E7 n/cm^2 . RPV materials not in the highly irradiated beltline region are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. Based upon 10 CFR 50.55a, the ASME Code Section XI 1986 Edition requires essentially 100% RPV weld volumetric examinations of beltline welds during every inspection interval. The RPV Outlet Nozzle Welds do not meet the requirements of a beltline weld due to a significantly lower fluence exposure, resulting in far less potential degradation of ductility. The McGuire Nuclear Station Unit 1 RPV was fabricated by the Combustion Engineering Company and is free from unacceptable fabrication defects. Combustion Engineering performed rigorous state-of-the-art RPV inspections following fabrication to ensure no significant flaws existed.

The Pressurizer Nozzle to Upper Head Welds (Weld Numbers 1PZR-12, 1PZR-15, 1PZR-16, and Numbers 1PZR-12R, 1PZR-15R, 1PZR-16R) are located on the upper head of the pressurizer and are not part of the reactor pressure vessel. 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. The McGuire Nuclear Station Unit 1 Pressurizer was fabricated by the Westinghouse and is free from unacceptable fabrication defects. Westinghouse performed rigorous state-of-the-art inspections following fabrication to ensure no significant flaws existed.

The McGuire Unit 1 RPV Outlet Nozzle geometry and Pressurizer Nozzle to Upper Head Weld geometry prevents obtaining 100% volumetric examination coverage and the 100% examinations are impractical. Replacement or re-design of these nozzles is not a viable alternative and would create an undue burden on Duke Energy Corporation.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category B-D will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and

is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Examination Category B-F, Items B5.70., B5.130. Pressure Retaining Dissimilar Metal Welds

Steam Generator (Nozzle-to-Safe End Butt Welds)
1SGD-INLET- SE (B05.070.007),
1SGD-OUTLET- SE (B05.070.008)

Piping Dissimilar Metal Butt Welds
1NC1F-4-2 (B05.130.014),
1NC1F-4-3 (B05.130.015)

These four Dissimilar Metal Butt Welds are limited due to material characteristics and single sided access caused by the component geometry prevents two beam path direction coverage of the examination volume. In order to obtain the required two beam path direction coverage, these four welds would have to be re-designed to allow scanning from both sides. The Steam Generator Nozzle to Safe End Butt Welds (Weld Numbers 1SGD-INLET-SE and 1SGD-OUTLET-SE) are located on the inlet and outlet of the steam generators for the reactor coolant piping. The McGuire Unit 1 Steam Generator Nozzle to Safe End Weld geometry prevented obtaining 100% volumetric examination coverage and therefore the 100% examinations are impractical. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference Attachment 4&5 for scan coverage.

Although the examination volume requirements as defined in ASME Section XI 1986 Edition, Figure IWB-2500-8 could not be met, the amount of coverage obtained for these examinations provided an acceptable level of quality and integrity. Furthermore, these welds were cut-out and re-welded during the steam generator replacement (1EOC11 outage). These new welds received a complete radiographic examination. There is no safety significance to the lack of weld examination coverage for the previous cycle.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category B-F will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Examination Category B-J, Items B9.11, B9.31, Pressure Retaining Welds in Piping

During the ultrasonic examination of the Reactor Coolant Pump 1A to Pipe, Weld Number 1NC1F-1-6, (B09.011.006) shown in Attachment 6, coverage of the required examination volume was limited due to single sided access caused by the elbow to pump geometry which prevented scanning from both sides of the weld.

During the ultrasonic examination of the Nozzle to Elbow Weld, Number 1NC1F-1850, (B09.011.033) shown in Attachment 7, coverage of the required examination volume was limited because no scan could be performed from the nozzle side of the weld due to the nozzle transition.

During the ultrasonic examination of the Pipe to Elbow, Weld Number 1NC1F-539, (B09.011.036) shown in Attachment 8 coverage of the required examination volume was limited due to diametric shrinkage on the pipe side of the weld. In order to obtain greater than 90% coverage, the base metal adjacent to the weld would have to be built up with the addition of weld metal to improve the transition.

During the ultrasonic examination of the Nozzle to Elbow Weld, Weld Number 1NC1F-542, (B09.011.040) shown in Attachment 9, coverage of the required examination volume could not be obtained. The examination coverage was limited because no scan could be performed from the nozzle due to the nozzle transition.

During the ultrasonic examination of the Nozzle to Elbow Weld. Number 1NC1F-544, (B09.011.047) shown in Attachment 10, coverage of the required examination volume could not be obtained. The examination coverage was limited because no scan could be performed from the nozzle due to the nozzle transition.

During the ultrasonic examination of the Nozzle to Elbow, Weld Number 1NC1F-1746, (B09.011.066) shown in Attachment 11, coverage of the required examination volume could not be obtained. The examination coverage was limited because no scan could be performed from the nozzle due to the nozzle transition.

During the ultrasonic examination of the Pipe to Nozzle Branch Connection, Weld Number 1NC47-WN4A, (B09.031.001) shown in Attachment 12, coverage of the required examination volume could not be obtained. The examination coverage was limited due to single sided access caused by the branch connection geometry that prevents scanning from both sides of the weld.

During the ultrasonic examination of the Pipe to Nozzle Branch Connection Weld, Weld Number 1NC47-WN4B (B09.031.002) shown in Attachment 13, coverage of the required examination volume could not be obtained. The examination coverage was limited due to single sided access caused by the branch connection geometry that prevents scanning from both sides of the weld.

During the ultrasonic examination of the Pipe to Nozzle Branch Connection Weld, Weld Number 1NC47-WN6 (B09.031.003) shown in Attachment 14, coverage of the required examination volume could not be obtained. The examination coverage was limited due to single sided access caused by the branch connection geometry that prevents scanning from both sides of the weld.

In order to obtain the required coverage these welds would have to be redesigned. The 100% volumetric examination is impractical due to nozzle or weld material geometry, or branch piping interference's. Replacement or re-design of this piping Class 1 piping is not a viable alternative and would create an undue burden on Duke Energy Company. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference Attachments 6 thru 14 for scan coverage.

Although the examination volume requirements as defined in ASME Section XI 1986 Edition, Figures IWB-2500-8 thru -11 could not be met, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity.

The reactor coolant system piping and branch nozzle welds listed above are located on the McGuire Unit 1 reactor coolant loop piping. 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 3.4.6.2 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.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category B-J will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

ASME Section XI Class 2 Components listed below:

Examination Category C-A, Items C1.30 Pressure Retaining Welds in Pressure Vessels

During the ultrasonic examination of the Tubesheet to Stub Barrel Weld 1SGA-02-03 (C01.030.001) shown in Attachment 15, limited scanning area was caused by the proximity of inspection ports and branch connection piping. In order to achieve more coverage these obstructions would have to be moved away from the weld. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of this weld, techniques were utilized to obtain the maximum possible coverage. Reference Attachment 15 for scan coverage.

Although the examination volume requirements as defined in ASME Section XI 1986 Edition, Figure IWC-2500-2 could not be met, the amount of coverage obtained for these examinations provided an acceptable level of quality and integrity.

The steam generators have subsequently been replaced and there is no safety significance to the past examination coverage. The current steam generators were fully inspected by BWI prior to installation and relief for inspection of currently installed equipment is not requested.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category C-A will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Examination Category C-F-1, Items C5.21 Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

During the ultrasonic examination of the Pipe to Flange Weld 1NI18-1 (C05.021.011) shown in Attachment 16, coverage of the required examination volume was limited due to single sided access caused by the pipe to flange

geometry preventing scanning from both sides of the weld. During the examination of this weld, techniques were utilized to obtain the maximum possible coverage. Reference Attachment 16 for scan coverage.

Although the examination volume requirements as defined in ASME Section XI 1986 Edition, Figure IWC-2500-7 could not be met, the amount of coverage obtained for these examinations provided an acceptable level of quality and integrity.

The Pipe to Flange Weld (Weld Number 1NI18-1) is located on the safety injection piping and is isolable from the reactor coolant system by two check valves. This weld was inspected by radiography and dye penetrant during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at this weld, it would be identified by decreasing cold leg accumulator level which is monitored by the operators or by 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 3.4.6.2 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.

The safety injection system Pipe to Flange weld 1NI18-1 examination coverage is limited due to pipe flange geometry preventing 100% volumetric examination coverage and the 100% examinations are impractical. Replacement or re-design of this piping is not a viable alternative and would create an undue burden on Duke Energy Corporation.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category C-F-1 will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

VII. Implementation Schedule:

These examinations will continue to be scheduled in accordance with the requirements of ASME Section XI for future inspection intervals at McGuire Nuclear Station, Unit 1.

VIII. Attachments

Attachment 1. Detailed listing of welds with limited ultrasonic coverage.

Attachment 2. Drawings of affected weld details including calculation methods for:

B01.030.001
B03.090.005A
B03.090.006A
B03.090.007A
B03.090.008A
B03.100.005
B03.100.006
B03.100.007
B03.100.008

Attachment 3. Drawings of affected weld details including calculation methods for:

B03.110.002
B03.110.005
B03.110.006
B03.120.002
B03.120.005
B03.120.006

Attachment 4. Drawings of affected weld details including calculation methods for:

B05.070.007
B05.130.014

Attachment 5. Drawings of affected weld details including calculation methods for:

B05.070.008
B05.130.015

Attachment 6. Drawings of affected weld details including calculation methods for:

B09.011.006

Attachment 7. Drawings of affected weld details including calculation methods for:

B09.011.033

Attachment 8. Drawings of affected weld details including calculation methods for:

B09.011.036

Attachment 9. Drawings of affected weld details including calculation methods
for:

B09.011.040

Attachment 10. Drawings of affected weld details including calculation methods
for:

B09.011.047

Attachment 11. Drawings of affected weld details including calculation methods
for:

B09.011.066

Attachment 12. Drawings of affected weld details including calculation methods
for:

B09.031.001

Attachment 13. Drawings of affected weld details including calculation methods
for:

B09.031.002

Attachment 14. Drawings of affected weld details including calculation methods
for:

B09.031.003

Attachment 15. Drawings of affected weld details including calculation methods
for:

C01.030.001

Attachment 16. Drawings of affected weld details including calculation methods
for:

C05.021.011

Evaluated By: Sam D. Lombardo Date 9/24/98

Reviewed By: Sam J. Underwood Date 9/24/98

Reviewed By
NDE Level III James J. McQuilley Date 9/24/98

Approved By: L. Kevin Phypse Date 9/28/98

| Item No. | Weld ID No. | Exam Category/ Figure No. | System Or Component | Function | Area To Be Examined | Reason For Request | Licensee Proposed Alternate Examination |
|--------------|-------------|------------------------------|---------------------|---|---------------------------------------|--|--|
| B01.030.001 | 1RPV7-442 | B-A IWB-2500-4 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Shell to Flange Weld | Limited scan due to geometric configuration. Actual coverage obtained=57.41% | None |
| B03.090.005A | 1RPV5-445E | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=43.00% | None |
| B03.090.006A | 1RPV5-445F | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=43.00% | None |
| B03.090.007A | 1RPV5-445G | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=43.00% | None |
| B03.090.008A | 1RPV5-445H | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=43.00% | None |
| B03.100.005 | 1RPV5-445ER | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=74.00% | None |
| B03.100.006 | 1RPV5-445FR | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=74.00% | None |
| B03.100.007 | 1RPV5-445GR | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=74.00% | None |
| B03.100.008 | 1RPV5-445HR | B-D IWB-2500-7 | Reactor Vessel | Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant | Outlet Nozzle to Shell | Limited scan due to geometric configuration. Actual coverage obtained=74.00% | None |
| B03.110.002 | 1PZR-12 | B-D IWB-2500-7 | Pressurizer | Provide a point in the reactor coolant loop where liquid and vapor can be maintained in equilibrium under saturated conditions for pressure control | PZR Spray Nozzle to Upper Head | Limited scan due to geometric configuration. Actual coverage obtained=67.00% | None |
| B03.110.005 | 1PZR-15 | B-D IWB-2500-7 | Pressurizer | Provide a point in the reactor coolant loop where liquid and vapor can be maintained in equilibrium under saturated conditions for pressure control | PZR Safety Nozzle to Upper Head | Limited scan due to geometric configuration. Actual coverage obtained=67.00% | None |

| | | | | | | | |
|-------------|------------|-----------------------------|---------------------------------|--|---|--|------|
| B09.011.066 | 1NC1F-1746 | B-J IWB-2500-8 | Piping / NPS 4" or Larger | | Elbow to Nozzle | Limited scan due to geometric configuration. Actual coverage obtained=53.00% | None |
| B09.031.001 | 1NC47-WN4A | B-J IWB-2500- 9,10,11 | Branch Pipe Connection Welds | | Pipe to Nozzle (Reactor Coolant Pipe Branch Connection) | Limited scan due to geometric configuration. Actual coverage obtained=49.50% | None |
| B09.031.002 | 1NC47-WN4B | B-J IWB-2500- 9,10,11 | Branch Pipe Connection Welds | | Pipe to Nozzle (Reactor Coolant Pipe Branch Connection) | Limited scan due to geometric configuration. Actual coverage obtained=48.20% | None |
| B09.031.003 | 1NC47-WN6 | B-J IWB-2500- 9,10,11 | Branch Pipe Connection Welds | | Pipe to Nozzle (Reactor Coolant Pipe Branch Connection) | Limited scan due to geometric configuration. Actual coverage obtained=49.50% | None |
| C01.030.001 | 1SGA-02-03 | C-A IWC-2500-2 | Steam Generator | Provide high quality steam to the Turbine | Tubesheet to Stub Barrel | Limited scan due to geometric configuration. Actual coverage obtained=86.57% | None |
| C05.021.011 | 1NI18-1 | C-F-1 IWC-2500-7 | Piping | | Pipe to Flange | Limited scan due to geometric configuration. Actual coverage obtained=87.50% | None |

DUKE POWER COMPANY
 MC GUIRE UNIT 1
 REACTOR VESSEL EXAMINATION

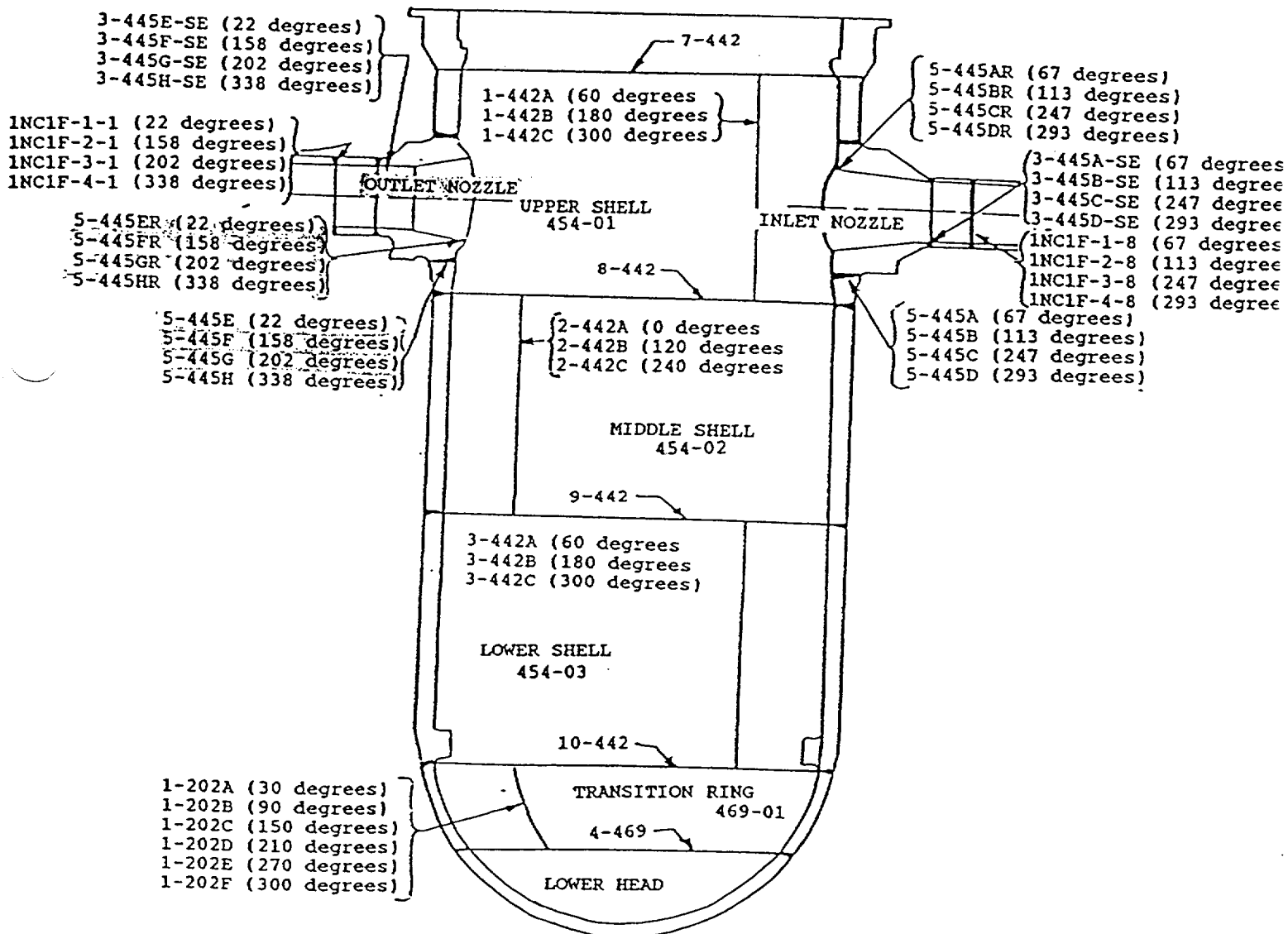


Figure 2

AMINATION COVERAGE FOR OUTLET NOZZLES 5-445E,F,G,&H INNER RADIUS 5-445ER, FR, GR & HR

SCAN PLAN DRAWING NO.: 1213930D-02

AGGREGATE COVERAGE OBTAINED FOR WELD: 43%

COVERAGE FROM BORE AND SHELL

AGGREGATE COVERAGE OBTAINED FOR INSIDE RADIUS: 74%

Zone Coverage Obtained

Weld and Adjacent Base Metal: 41% Near (ID) Surface: 58% Inside Radius: 74%

HORIZONTAL SECTION EVALUATION

| | | | | | | | |
|-----------------------------------|----------------|-------------------------|------------------------|---------------------------|---------------------------|---------------------|--|
| Weld Diameter: | | 53 in. | | Nozzle Bore Diameter: | | 29 in. | |
| Area Measurement | | | | Volume Calculation | | | |
| Weld | | 18.18 sq. in. | | Weld | | 1513.6 cu. in. | |
| Base Metal | | 171.07 sq. in. | | Adjacent Base Metal | | 14242.0 cu. in. | |
| Near Surface | | 15.12 sq. in. | | Near Surface | | 1258.8 cu. in. | |
| Inside Radius | | 6.88 sq. in. | | Inside Radius | | 318.0 cu. in. | |
| Examination Coverage Calculations | | | | | | | |
| Adjacent Base Metal | | | | | | | |
| Exam. Angle (deg.) | Beam Direction | Area Examined (sq. in.) | Degrees Examined (in.) | Volume Examined (cu. in.) | Volume Required (cu. in.) | Percent Examined | |
| 0/45 | bore | 184.7 | 108.1 | 9085.4 | 9288.7 | 98% | |
| 0/45 | bore | 0.0 | 73.9 | 0.0 | 8486.7 | 0% | |
| 45/80 | shell/3 | 49.6 | 108.1 | 2433.5 | 9288.7 | 26% | |
| 45/80 | shell/3 | 0.0 | 73.9 | 0.0 | 8486.7 | 0% | |
| 45/80 | shell/4 | 49.6 | 108.1 | 2433.5 | 9288.7 | 26% | |
| 45/80 | shell/4 | 0.0 | 73.9 | 0.0 | 8486.7 | 0% | |
| 0 | shell | 49.6 | 108.1 | 2433.5 | 9288.7 | 26% | |
| 0 | shell | 0.0 | 73.9 | 0.0 | 8486.7 | 0% | |
| Totals: | | | | 16365.8 | 66565.2 | 29% | |
| Examination Coverage Calculations | | | | | | | |
| Exam. Angle (deg.) | Beam Direction | Area Examined (sq. in.) | Degrees Examined (in.) | Volume Examined (cu. in.) | Volume Required (cu. in.) | Percent Examined | |
| 70 | shell/3,4 | 8.3 | 108.1 | 311.4 | 742.1 | 42% (PERPENDICULAR) | |
| 70 | shell/3,4 | 0.0 | 73.9 | 0.0 | 516.7 | 0% (PERPENDICULAR) | |
| 45 | bore | 12.1 | 108.1 | 595.7 | 742.1 | 80% (PARALLEL) | |
| 45 | bore | 0.0 | 73.9 | 0.0 | 516.7 | 0% (PARALLEL) | |
| Totals: | | | | 907.1 | 2000.9 | 45% | |
| Examination Coverage Calculations | | | | | | | |
| Exam. Angle (deg.) | Beam Direction | Area Examined (sq. in.) | Degrees Examined (in.) | Volume Examined (cu. in.) | Volume Required (cu. in.) | Percent Examined | |
| 70 | axial | 6.7 | 108.1 | 153.8 | 187.5 | 82% | |
| 70 | axial | 0.0 | 73.9 | 0.0 | 130.6 | 0% | |
| 70 | circ | 5.8 | 108.1 | 155.0 | 187.5 | 83% | |
| 70 | circ | 0.0 | 73.9 | 0.0 | 130.6 | 0% | |
| Totals: | | | | 308.8 | 508.4 | 81% | |

VERTICAL SECTION EVALUATION

| Weld Diameter: 53 in. | | | | Nozzle Bore Diameter: 29 in. | | | |
|-----------------------------------|--------------------|----------------|-------------------------|------------------------------|---------------------------|---------------------------|---------------------|
| Area Measurement | | | | Volume Calculation | | | |
| Weld | 19.68 | sq. in. | | Weld | 1638.4 | cu. in. | |
| Adjacent Base Metal | 190.67 | sq. in. | | Adjacent Base Metal | 15865.4 | cu. in. | |
| Near Surface | 16.89 | sq. in. | | Near Surface | 1406.1 | cu. in. | |
| Inside Radius | 6.80 | sq. in. | | Inside Radius | 309.8 | cu. in. | |
| Examination Coverage Calculations | | | | | | | |
| Weld and Adjacent Base Metal | | | | | | | |
| Entry # | Exam. Angle (deg.) | Beam Direction | Area Examined (sq. in.) | Degrees Examined (in.) | Volume Examined (cu. in.) | Volume Required (cu. in.) | Percent Examined |
| 1 | 0/45 | bore | 210.4 | 180.0 | 17512.9 | 17503.8 | 100% |
| 2 | 45/80 | shell/3 | 77.8 | 180.0 | 6474.5 | 17503.8 | 37% |
| 3 | 45/80 | shell/4 | 77.8 | 180.0 | 6474.5 | 17503.8 | 37% |
| 4 | 0 | shell | 77.8 | 180.0 | 6474.5 | 17503.8 | 37% |
| Totals: | | | | | 38938.6 | 70016.1 | 63% |
| Near Surface | | | | | | | |
| Entry # | Exam. Angle (deg.) | Beam Direction | Area Examined (sq. in.) | Degrees Examined (in.) | Volume Examined (cu. in.) | Volume Required (cu. in.) | Percent Examined |
| 1 | 70 | shell/3,4 | 7.2 | 180.0 | 602.7 | 1406.1 | 43% (PERPENDICULAR) |
| 2 | 45 | bore | 16.9 | 180.0 | 1406.1 | 1406.1 | 100% (PARALLEL) |
| Totals: | | | | | 2008.9 | 2812.3 | 71% |
| Inside Radius | | | | | | | |
| Entry # | Exam. Angle (deg.) | Beam Direction | Area Examined (sq. in.) | Degrees Examined (in.) | Volume Examined (cu. in.) | Volume Required (cu. in.) | Percent Examined |
| 1 | 70 | axial | 6.7 | 180.0 | 303.8 | 309.8 | 98% |
| 2 | 70 | circ | 5.1 | 180.0 | 231.4 | 309.8 | 75% |
| Totals: | | | | | 535.2 | 619.6 | 86% |

Horizontal section coverage requirement is considered to be 180° total; 45° each side of 90° and 270°.

Note: The vertical section coverage requirement is considered to be 180° total; 45° each side of 0° and 180°.

SER NO. 98-001

ATTACHMENT 2

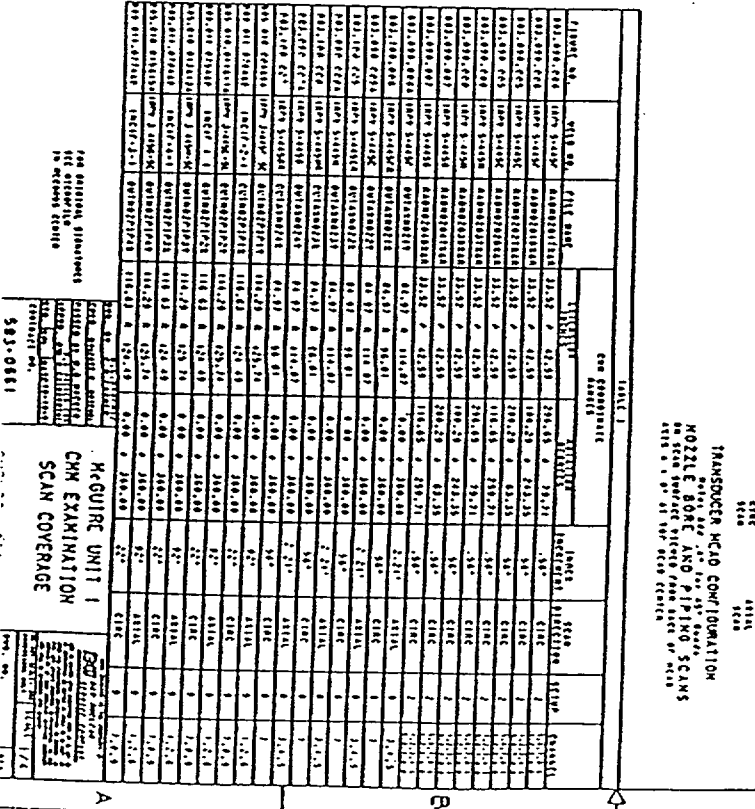
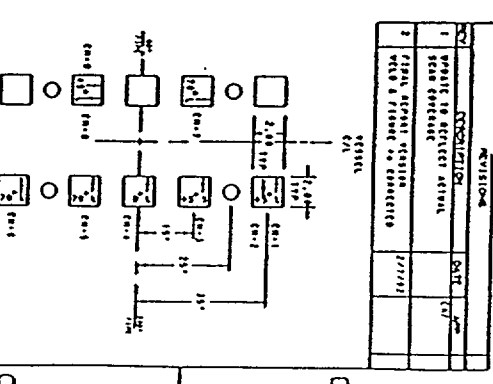
B03.090.005A ; B03.090.007A

B03.090.006A ; B03.090.008A

B03.100.005, .006, .007, .008

1RPV5-445ER, 445FR, 445GR, 445HR

IRPV5-445ER, 445FR, 445GR, 445HR

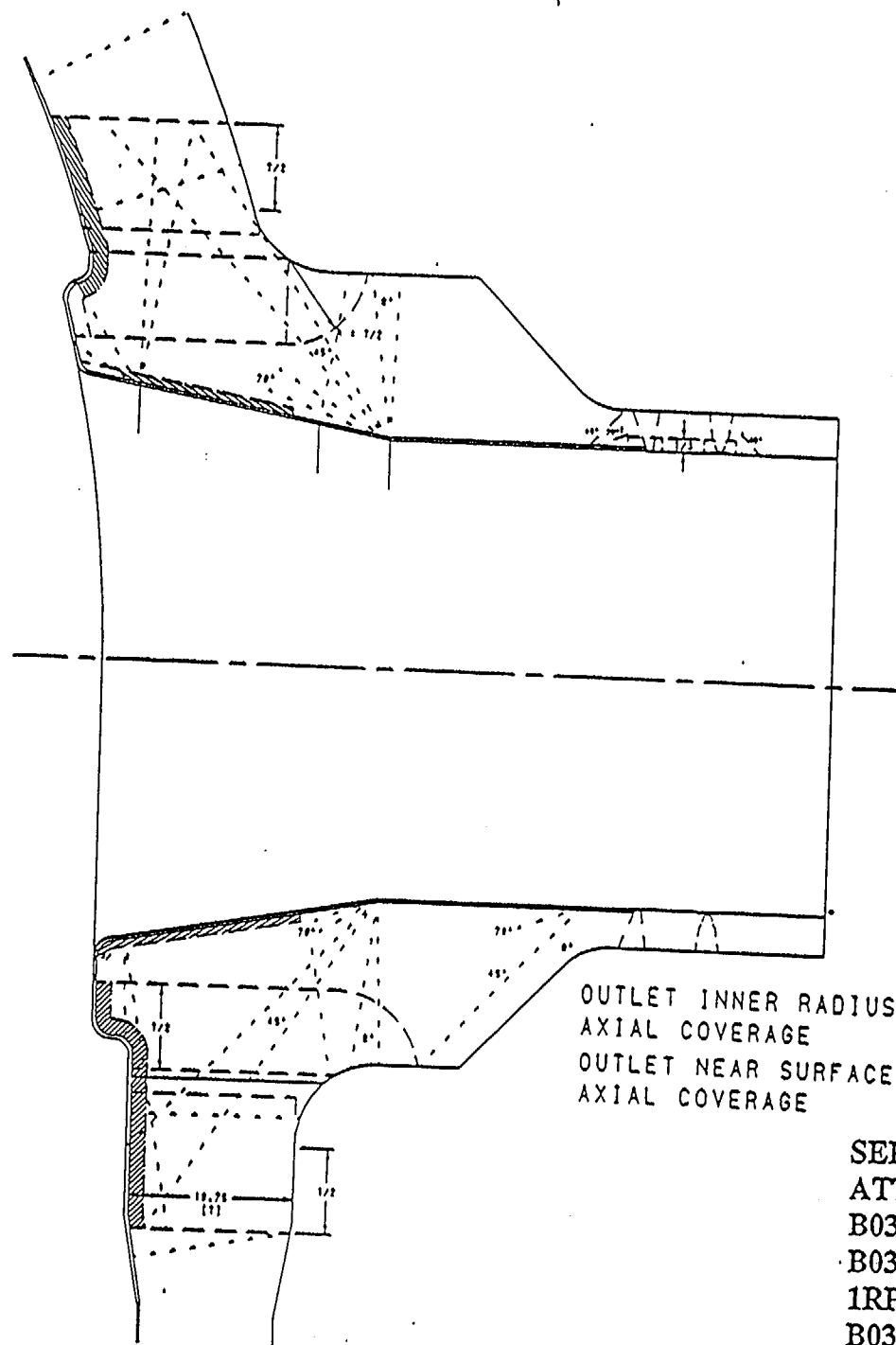


QUICK NOZZLE OBSERVATIONS

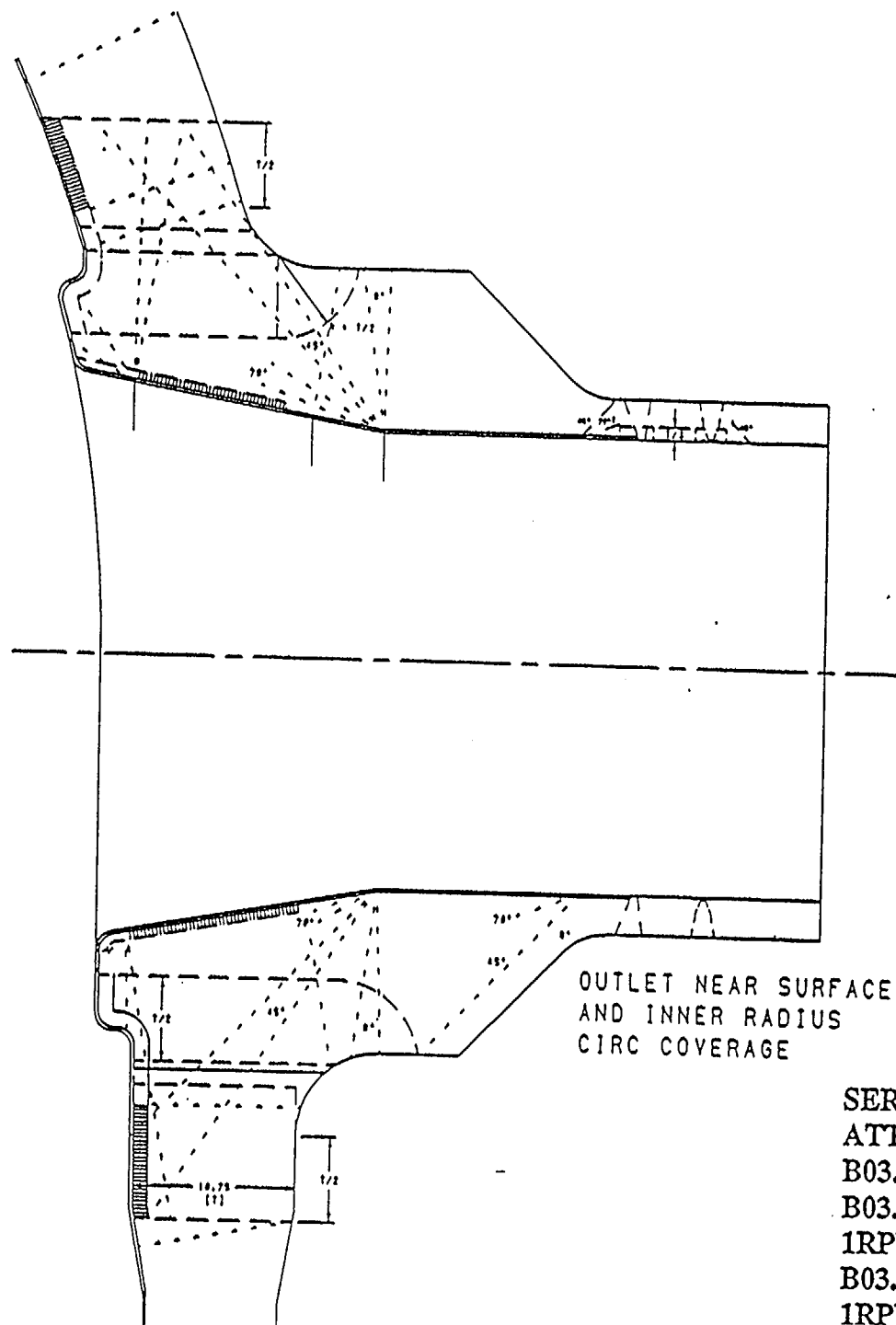
585-066

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| DATE | 11/11/11 |
| TIME | 11:11 |



SER NO. 98-001
 ATTACHMENT 2
 B03.090.005A ; B03.090.006A
 B03.090.007A ; B03.090.008A
 1RPV5-445E, 445F, 445G, 445H
 B03.100.005, .006, .007, .008
 1DDV5 115ED 115ED 115ED



OUTLET NEAR SURFACE
AND INNER RADIUS
CIRC COVERAGE

SER NO. 98-001
ATTACHMENT 2
B03.090.005A ; B03.090.006A
B03.090.007A ; B03.090.008A
1RPV5-445E, 445F, 445G, 445H
B03.100.005, .006, .007, .008
1RPV5-445ER, 445FR, 445GR, 445HR

| | | | | | | | |
|--|--|--|--------------------------------------|---|--|---|--|
| DUKE POWER COMPANY | | | | Exam Start: <u>1746</u> | | Form NDE-UT-MNS-2 | |
| ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS | | | | Exam Finish: <u>1832</u> | | Revision 1 | |
| Station: <u>McGuire</u> | | Unit: <u>1</u> | Component/Weld ID: <u>IRPV 7-442</u> | | | Date: <u>3-23-93</u> | |
| Weld Length (in.): <u>N/A</u> | | Surface Condition: <u>SMOOTH</u> | | Lo: <u>0° AXIS</u> | | Surface Temperature: <u>93</u> deg.F | |
| Examiner: <u>Carl [Signature]</u> | | Level: <u>II</u> | | Scans: 45 <input type="checkbox"/> _____ dB | | Pyromete S/N: <u>McQua 32838</u> | |
| Examiner: _____ | | Level: _____ | | 45T <input type="checkbox"/> _____ dB | | Cal Due: <u>7-28-93</u> | |
| Procedure: <u>NDE 651</u> | | Rev: <u>0</u> | | 60 <input type="checkbox"/> _____ dB | | Configuration: <u>WELD</u> <u>N/A</u> Flow <u>N/A</u> <u>Nozzle Belt</u> to <u>FLANGE</u> | |
| Calibration Sheet No: <u>193011</u> | | FC: <u>013-25-93</u> <u>N/A</u> <u>93-14</u> | | 60T <input type="checkbox"/> _____ dB | | | |
| | | | | Other: <u>0° - 71</u> dB | | Scan Surface: OD | |

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|-----------|--------|-------|-------|---------|---------|--------------------------------------|---------|---------|---------|----------|------------|------|-------|
| | | | | | | | W1 | Mp1 | W2 | Mp2 | | | | |
| | | | | | 20%dac | 20%dac | 20%dac | 20%dac | 20%dac | 20%dac | | | | |
| | | | | | HMA | HMA | HMA | HMA | HMA | HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Remarks: NO RECORDABLE INDICATIONS FOUND

| | | | | |
|---|------------------|----------------------|--|----------------------|
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | | | Sheet _____ of _____ | |
| Reviewed By: <u>[Signature]</u> | Level: <u>II</u> | Date: <u>7/30/93</u> | Authorized Inspector: <u>[Signature]</u> | Date: <u>7/21/93</u> |
| | | | Item No: <u>B01.030.001</u> | |

ORIGINAL NO. 16-001
ATTACHMENT 2
PAGE 8 of 16

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: IRPV 7-442 Item No: B01.030.001

remarks:

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L 0° to L 360° ID DIAM. INCHES FROM WO 171.00" to 172.56"
 ANGLE: ☒ 0 ☐ 45 ☐ 60 other FROM 0 DEG to 360 DEG

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L 0° to L 360° ID DIAM. INCHES FROM WO 184.875" to 191.875"
DUE TO STUD HOLES LOCATED 5" APART
 ANGLE: ☒ 0 ☐ 45 ☐ 60 other FROM 0 DEG to 360 DEG

☐ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L _____ to L _____ INCHES FROM 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

Sketch(s) attached

☒ yes

☐ no

Prepared By: Carl [Signature]

Level: II

Date: 3-25-93

Sheet _____ of _____

Reviewed By: [Signature]

Date: 7/20/93

Authorized Inspector: [Signature]

Date: 7-21-93

SERIAL NO. 98-001
 ATTACHMENT 2
 PAGE 9 of 16

Determining Exam AREA By Zone

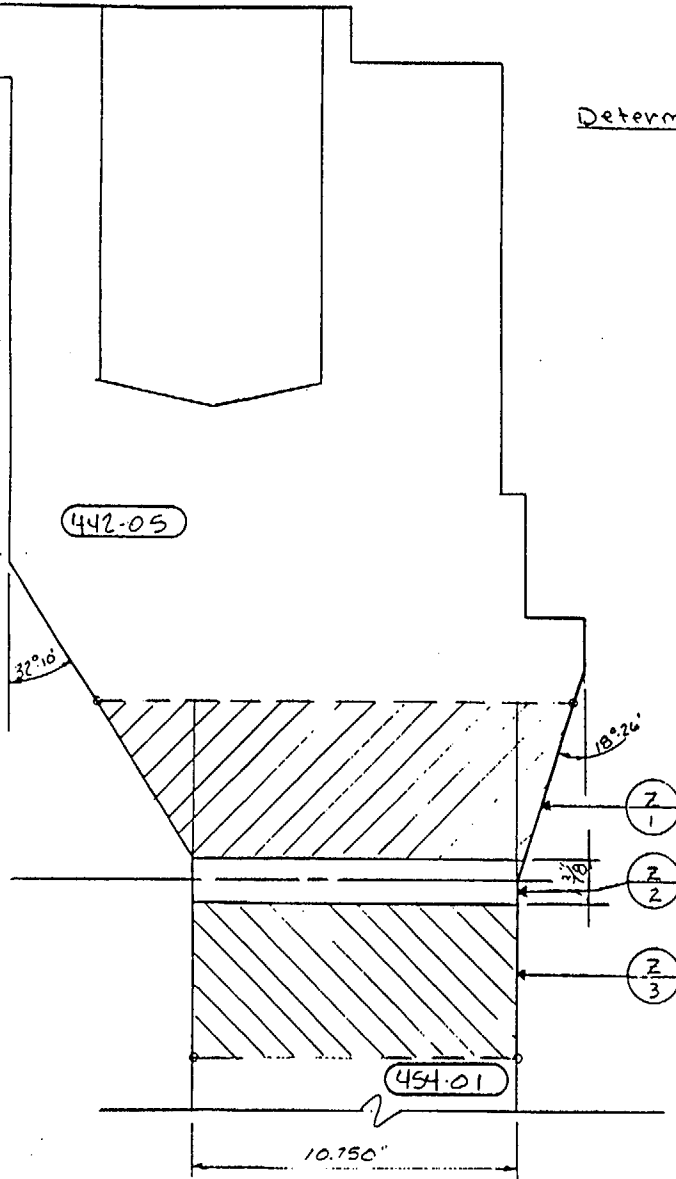
- $\frac{Z}{1}$ ZONE 1 BASE METAL FLANGE SIDE
- $\frac{Z}{2}$ ZONE 2 WEID METAL
- $\frac{Z}{3}$ ZONE 3 BASEMETAL NOZZLE BELT

ZONE 1 AREA $\frac{3.2 \times 5}{2} + \frac{1.9 \times 5.0}{2} + 10.5 \times 5.0$
 $8 + 4.75 + 52.5$
 $\text{total} = \frac{65.25 \text{ sq. in.}}{1} = 49\% \text{ of total AREA}$

ZONE 2 AREA $1.375 \times 10.75 + \frac{.7 \times .3}{2}$
 $14.78 + .105$
 $\text{total} = \frac{14.89 \text{ sq. in.}}{1} = 11\% \text{ of total AREA}$

ZONE 3 AREA 5.0×10.75
 $\text{total} = \frac{53.75 \text{ sq. in.}}{1} = 40\% \text{ of total AREA}$

Total EXAM AREA = $\frac{133.9 \text{ sq in}}{1}$



B01.030.001

SCALE 1"=40"

DUKE POWER COMPANY

RV NOZZLE BELT TO
RV FLANGE
PC-442.05 TO 454.01

| NO. | | | | | | | | | | REVISIONS | | | | NO. | | | | NO. | | | | NO. | | | |
|-------|--|--|--|--|--|--|--|--|--|-----------|--|--|--|------|--|--|--|------|--|--|--|------|--|--|--|
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Station McGuire Unit 1 Rev. _____ File No. LRPV 7-442 Sheet 1 of 7
Subject _____By Carl [Signature] Date 3-25-93
Prob No. B01.030.001 Checked By [Signature] Date 7/20/93DESCRIPTION: FLANGE TO NOZZLE BELT
PC-442-05 TO 454-01

NUMBER OF SCANS = 1

EXAM AREA = 133.9 sq. in.

AREA LOSSES

ZONE 1 32.670

ZONE 2 5.308

ZONE 3 19.050

TOTAL = 57.028 sq. in.

TO DETERMINE ACTUAL LOSS OF COVERAGE
 $57.028 / 133.9 = 42.59\%$ TO DETERMINE ACTUAL PERCENT OF COVERAGE
 $100\% - 42.59\% = 57.41\%$

NO OTHER LIMITATIONS

TOTAL COVERAGE 57.41%

Station McGuire Unit 1 Rev. _____ File No. IRPV 7-442 Sheet 2 Of 7
Subject _____

By Carl Quinn Date 3-25-91
Prob No. B01.030.001 Checked By QTS Date 7/20/93

ZONE 1 BASE METAL FLANGE SIDE

AREA LOSS DUE TO TRANSDUCER LIMITATIONS

$$.65 \times 5.0 =$$

3.25 Sq. in.

AREA LOSS DUE TO I.D. FLANGE AREA

$$.8 \times 5.0 + 1.5 \times 5.0 \div 2 =$$

11.15 Sq. in.

AREA LOSS DUE TO BOLT HOLES

$$DIA. (188.37) \times \pi = 591.78 \text{ in} \div 2 = 295.85$$

$$\text{BOLT HOLES } 27 \times 7.0 (DIA) = 189.00$$

$$\text{PERCENTAGE OF LOSS FOR BOLT HOLES} = 64.1\%$$

AREA OF LOSS FOR BOLT HOLES

$$4.15 \times 5.0 + 3.1 \times 5.0 \div 2 =$$

28.50

X .641

18.27 Sq. in.

TOTAL AREA LOSS ZONE 1

3.25 Sq. in.

11.15 Sq. in.

18.27 Sq. in.

32.67 Sq. in.



Excluding bolt holes

Area covered

AREA not covered

DRALINE (B)

B01.730.001

PC-442.05 TO 454-01

EV.

Station McGUIRE Unit 1 Rev. _____ File No. LRPV 7-442 Sheet 3 Of 7
 Subject _____

By Carl [Signature] Date 3-25-9
 Prob No. BOL.030.001 Checked By [Signature] Date 7/20/93

ZONE 2 WELD METAL

AREA OF LOSS DUE TO TRANSDUCER LIMITATIONS

$$.65 \times 1.375 = .89 \text{ sq. in.}$$

AREA OF LOSS DUE TO I.D. FLANGE AREA

$$.50 \times 1.375 + .60 \times .20 \div 2 = .808 \text{ sq. in.}$$

AREA OF LOSS DUE TO BOLT HOLES

$$\text{DIA. } (188.37) \times \pi = 591.78 \text{ in.} \div 2 = 295.85$$

$$\text{BOLT HOLES } 27 \times 7.0 \text{ in. (DIA)} = 189.00$$

$$\text{PERCENTAGE OF LOSS FOR BOLT HOLES} = 64.1\%$$

AREA OF LOSS FOR BOLT HOLES

$$4.1 \times 1.375 = 5.6375 \text{ sq. in.}$$

$$\times 64.1\%$$

$$3.61 \text{ sq. in.}$$

TOTAL AREA LOSS ZONE 2

$$.890 \text{ sq. in.}$$

$$.808 \text{ sq. in.}$$

$$3.610 \text{ sq. in.}$$

$$5.308 \text{ sq. in.}$$

Station McGuire Unit 1 Rev. _____ File No. LRPV7-442 Sheet 4 of 7
Subject _____

By Carl Jones Date 3-25-9
Prob No. B01.030.001 Checked By [Signature] Date 7/20/92

Zone 3 Base Metal Nozzle Belt

Area of Loss Due to Transducer Limitations

$$.65 \times 5.0 = 3.25 \text{ sq. in.}$$

Area of Loss Due to ID Flange Area

$$.50 \times 5.0 = 2.50 \text{ sq. in.}$$

Area of Loss Due to Bolt Holes

$$\text{DIA. } (188.37) \times \pi = 591.78 \text{ in.} \div 2 = 295.85$$

$$\text{Bolt Holes } 27 \times 7.0 (\text{DIA}) = 189.00$$

$$\text{Percentage of Loss For Bolt Holes} = 64\%$$

Area of Loss For Bolt Holes

$$4.15 \times 50 = 20.75 \text{ sq. in.}$$

$$\times 64.1\%$$

$$13.30 \text{ sq. in.}$$

TOTAL AREA LOSS Zone 3

$$3.25 \text{ sq. in.}$$

$$2.50 \text{ sq. in.}$$

$$13.30 \text{ sq. in.}$$

$$19.05 \text{ sq. in.}$$

DUKE POWER COMPAN.

ULTRASONIC CALIBRATION SHEET FOR USK-7D INSTRUMENTS

FORM NDE-U, -1E

REVISION 2

Station: MCGUIRE

Unit: 1

Date: 8-24-94

Sheet Number: 9401047

Procedure: NDE621

Rev: 1

F/C: N/A

Couplant: ULTRAGEL

Batch Number: 093001

Examiner: *W. C. Leeper*Level: *H*

Calibration Block ID: 50338

Pyrometer S/N: MCNDE-27023

Examiner:

Level:

Calibration Block Temp: 90°F

Cal. due: 10-14-94

REFERENCE BLOCK

ID: 91-5861

Type: ROMPAS

Material: C/S

SIMULATOR BLOCK

ID: 91-5861

Reflector Type: RADIUS

Gain: 37 DB

Signal Ampl: 49 %

Metal Path: 5.2"

INSTRUMENT

Manufacturer: Krautkramer

Serial No: 32810-797

TRANSDUCER

Type: Single ☒ Dual ☐ Size: 1.0" Freq: 2.25 Mhz Wedge AWS

Manufacturer: AEROTECH Ser no: F21877

Meas. *4* 45°

INSTRUMENT SETTINGS

Gain 41DB
 Range 6.0"
 MTVEL 127.4
 Delay 13.4
 Pulser HIGH
 Reject OFF
 Freq 1-5
 Zero 11.49
 Display FULL
 PRF HIGH

Jack: T ☐ R ☒

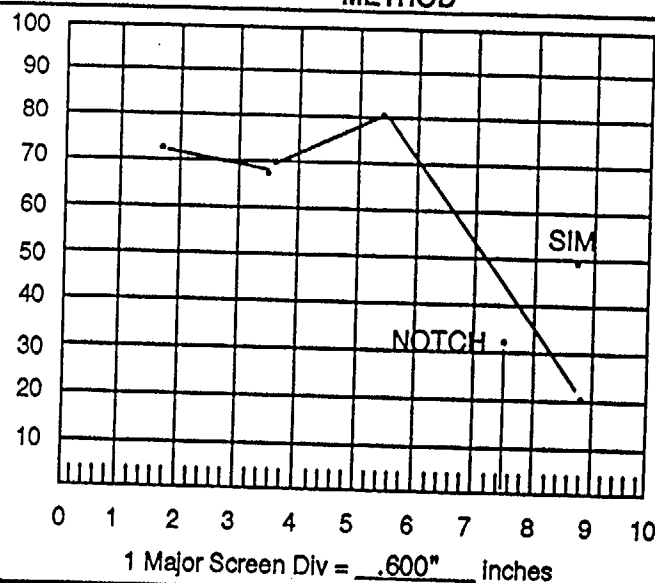
CALIBRATION

| Reflector Type | Amplitude | Metal Path |
|----------------|-----------|------------|
| HOLE | %FSH | inches |
| 1 /8 node | 72% | 1.0" |
| 2 /8 node | 69% | 2.10" |
| 3 /8 node | 80% | 3.30" |
| 5 /8 node | 20% | 5.28" |
| other NOTCH | 32% | 4.50" |

Cal Direction: axial ☒ circ. ☒Wave Mode: Long. ☐ shear ☒
surf. ☐Remarks: 13 DB DIFF. BETWEEN
3/4" & 5/4"

Item No: B03.110.002, B03.110.005, B03.110.006

METHOD



CABLES

RG58 ☐RG174 ☒

Length: 6'

Initial Cal Time

0915

Cal Checks

Time Initials

1230 *WCL*1441 *WCL*

FINAL

Reviewer:

*C. D. Jolley*Level: *H*

Date:

8/31/94

Authorized Inspector

W. C. Leeper

Date:

9/28/94

 SERIAL NO 78-001
 ATTACHMENT 3
 PAGE 1 of 39

DUKE POWER COMPANY

FORM NDE-L

ULTRASONIC CALIBRATION

| | | | | | |
|--|--------------|--|--|--|-----------------------------------|
| Station: MCGUIRE | | Unit: 1 | Date: 8-24-94 | Sheet Number: 9401046 | |
| Procedure: NDE641 | | Rev: 1 | F/C: N/A | Couplant: ULTRAGEL | |
| Examiner: <u>W.C. Leaper</u> | | Level: <u>II</u> | Calibration Block ID: <u>50338</u> | | Pyrometer S/N: <u>MCNDE-27023</u> |
| Examiner: | | Level: | Calibration Block Temp: 90°F | | Cal. due: 10-14-94 |
| REFERENCE BLOCK | | | SIMULATOR BLOCK | | |
| ID: <u>91-5861</u> | | | ID: <u>91-5861</u> | | |
| Type: <u>ROMPAS</u> | | | Reflector Type: <u>B/W</u> | | |
| Material: <u>C/S</u> | | | Gain: <u>0 DB</u> | | |
| | | | Signal Ampl: <u>50%</u> | | |
| | | | Metal Path: <u>2.0"</u> | | |
| INSTRUMENT | | | TRANSDUCER | | |
| Manufacturer: Krautkramer | | | Type: Single <input checked="" type="checkbox"/> Dual <input type="checkbox"/> Size: <u>1.0"</u> | | |
| Serial No: <u>32810-797</u> | | | Freq: <u>2.25</u> Mhz Wedge <u>AWS</u> | | |
| | | | Manufacturer: <u>AEROTECH</u> Ser no: <u>J19024</u> | | |
| | | | Meas. <u>Δ</u> <u>0</u> ° | | |
| INSTRUMENT SETTINGS | | CALIBRATION | | METHOD | |
| Gain | <u>14DB</u> | Reflector Type | Amplitude | Metal Path | |
| Range | <u>5.0"</u> | HOLE | %FSH | Inches | |
| MTVEL | <u>231.8</u> | 1 /8 node | <u>65%</u> | <u>.66"</u> | |
| Delay | <u>.6</u> | 2 /8 node | <u>72%</u> | <u>1.41"</u> | |
| Pulser | <u>HIGH</u> | 3 /8 node | <u>80%</u> | <u>2.15"</u> | |
| Reject | <u>OFF</u> | /8 node | | | |
| Freq | <u>1-5</u> | other | | | |
| Zero | <u>.71</u> | Cal Direction: axial <input checked="" type="checkbox"/> circ. <input checked="" type="checkbox"/> | | | |
| Display | <u>FULL</u> | Wave Mode: Long. <input checked="" type="checkbox"/> shear <input type="checkbox"/> | | | |
| PRF | <u>HIGH</u> | surf. <input type="checkbox"/> | | | |
| Jack: T <input type="checkbox"/> R <input checked="" type="checkbox"/> | | Remarks: | | | |
| | | Item No: B03.110.002, B03.110.005, B03.110.006 | | | |
| Reviewer: <u>C.D. Jolley</u> | | Level: <u>II</u> | Date: <u>8/31/94</u> | Authorized Inspector: <u>[Signature]</u> | |
| | | | | Date: <u>9-28-94</u> | |

 RG58 ☐
 RG174 ☒
 Length: 6'

Initial Cal Time

0905

Cal Checks

Time Initials

1206 WCL1440 WCL

FINAL

 SERIAL NO. 78-001
 ATTACHMENT 3
 PAGE 2 of 39

DUKE POWER COMPANY

ULTRASONIC CALIBRATION SHEET FOR USK-7D INSTRUMENTS

FORM NDE-L-1-E

REVISION 2

Station: MCGUIRE

Unit: 1

Date: 8-24-94

Sheet Number: 9401048

Procedure: NDE621

Rev: 1

F/C: N/A

Couplant: ULTRAGEL

Batch Number: 093001

Examiner: *W.C. Leeper*

Level: II

Calibration Block ID: 50338

Pyrometer S/N: MCNDE-27023

Examiner:

Level:

Calibration Block Temp: 90°F

Cal. due: 10-14-94

REFERENCE BLOCK

SIMULATOR BLOCK

ID: 91-5861

ID: 91-5861

Reflector Type: RADIUS

Type: ROMPAS

Material: C/S

Gain: 44 DB

Signal Ampl: 32 %

Metal Path: 8.0"

INSTRUMENT

TRANSDUCER

Manufacturer: Krautkramer

Type: Single ☒ Dual ☐ Size: 1.0" Freq: 2.25 Mhz Wedge: AWS

Serial No: 32810-797

Manufacturer: AEROTECH Ser no: E24907

Meas. Δ 61°

INSTRUMENT SETTINGS

CALIBRATION

METHOD

CABLES

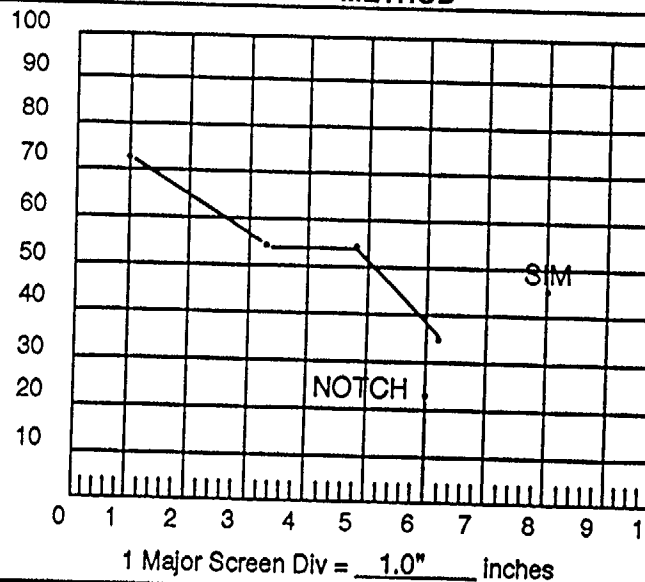
Gain: 44DB
 Range: 10.0"
 MTVEL: 128.3
 Delay: 14.6
 Pulser: HIGH
 Reject: OFF
 Freq: 1-5
 Zero: 15.86
 Display: FULL
 PRF: HIGH

Reflector Type: HOLE
 1 /8 node: 72%
 2 /8 node: 52%
 3 /8 node: 52%
 5 /8 node: 32%
 other NOTCH: 20%
 Metal Path: 1.60"
 3.20"
 4.70"
 6.20"
 6.10"

Cal Direction: axial ☒ circ. ☒
 Wave Mode: Long. ☐ shear ☒
 surf. ☐

Remarks: 3 DB DIFF. BETWEEN
 3/4" & 5/4"

Item No: B03.110.002, B03.110.005, B03.110.006



RG58 ☐
 RG174 ☒
 Length: 6'

Initial Cal Time

0928

Cal Checks

Time Initials

1259 *WCL*1443 *WCL*

FINAL

Jack: T ☐ R ☒

Reviewer:

C.D. Jolley

Level: II

Date: 8/31/94

Authorized Inspector

W.C. Leeper

Date:

9-28-94

SERIAL NO 98-001
 ATTACHMENT 3
 PAGE 3 OF 39

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1210

Form NDE-UT-2,

Exam Finish: 1311

Revision 4

Station: MCGUIRE

Unit: 1

Component/Weld ID: 1PZR-12

Date: 8-24-94

Weld Length (in.): 40.0"

Surface Condition: BUFFED

Lo: 9.2.3

Surface Temperature: 90 ° F

Examiner: *W. C. Leaper*

Level: II

Scans:

45 ☒ 47 dB 70 ☐ dB

Pyrometer S/N: MCNDE-27023

Cal Due: 10/14/94

Examiner:

Level:

45T ☐ dB 70T ☐ dB

Configuration: NOZZLE

1 Flow 2

Procedure: NDE-621

Rev: 1

FC: N/A

PZR to NOZZLE

Calibration Sheet No: 9401046
9401047
9401048

60 ☒ 50 dB


Scan Surface: OD

Applies to NDE-680 only

60T ☐ dB

Other: 0° 20 dB

Skew Angle:

| IND # |  | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|---|-----------|--------|-------|-------|--------------------------|------------|------------|------------|------------|------------|----------|------------|------|-------|
| | | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | |
| | | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | 0° | | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | 45° | | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | 60° | | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐ no ☒

Sheet of

Reviewed By:

Level: II

Date:

Authorized Inspector

Date

Item No:

B03.110.002

SEKIAL NO 78-001
ATTACHMENT 3
PAGE 4 of 39

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1PZR-12 Item No: B03.110.002

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw
 FROM L_____ to L_____ INCHES FROM WO 1.4" to BEYOND
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other _____ FROM 0 DEG to 360 DEG

DUE TO 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: W. C. Lepp

Level: II

Date: 9-25-94

Sheet _____ of _____

Reviewed By: C. D. Jolley

Date: 9/31/94

Authorized Inspector: [Signature]

Date: 9-28-94

SERIAL NO 98-001
 ATTACHMENT 3
 PAGE 5 of 34

Limited Exam Data Sheet

Station MCGuire Unit 1 ID. # 1PZR-12
By W.C. Leaper Date 9-24-94 Item # B03.10.002
Checked By C.D. Jolley Date 9/31/94 Page Of

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area x (Number of Scans) = (% Factor)

Vessels:

Area Loss : Zone #1
 Zone #2
 Zone #3

Total Zone Loss / (% Factor) x 100 = % of Loss

Lump Sum Loss From Other Limitations + %

Total Loss %

100% - (Total Loss) 33% = 67% of Coverage *See Attached*
(Additional % of Partial Coverage) *Sheets*

Qualifies for Request for Relief ☐ Yes ☐ No *1 of 5*

Piping:

Axial Scan (Loss) / (% Factor) x 100 = % of Loss

Circumferential Scan Over Root Area ☐ Yes ☐ No % of Loss

Axial Loss + Circ. Loss = / 2 = % Loss

Additional Losses (Due to hangers, restraints, etc.) + % Loss

Explain: Total % Loss

100% - (Total Loss) = % of Coverage

Qualifies for Request for Relief ☐ Yes ☐ No

Disposition:

By: Date:

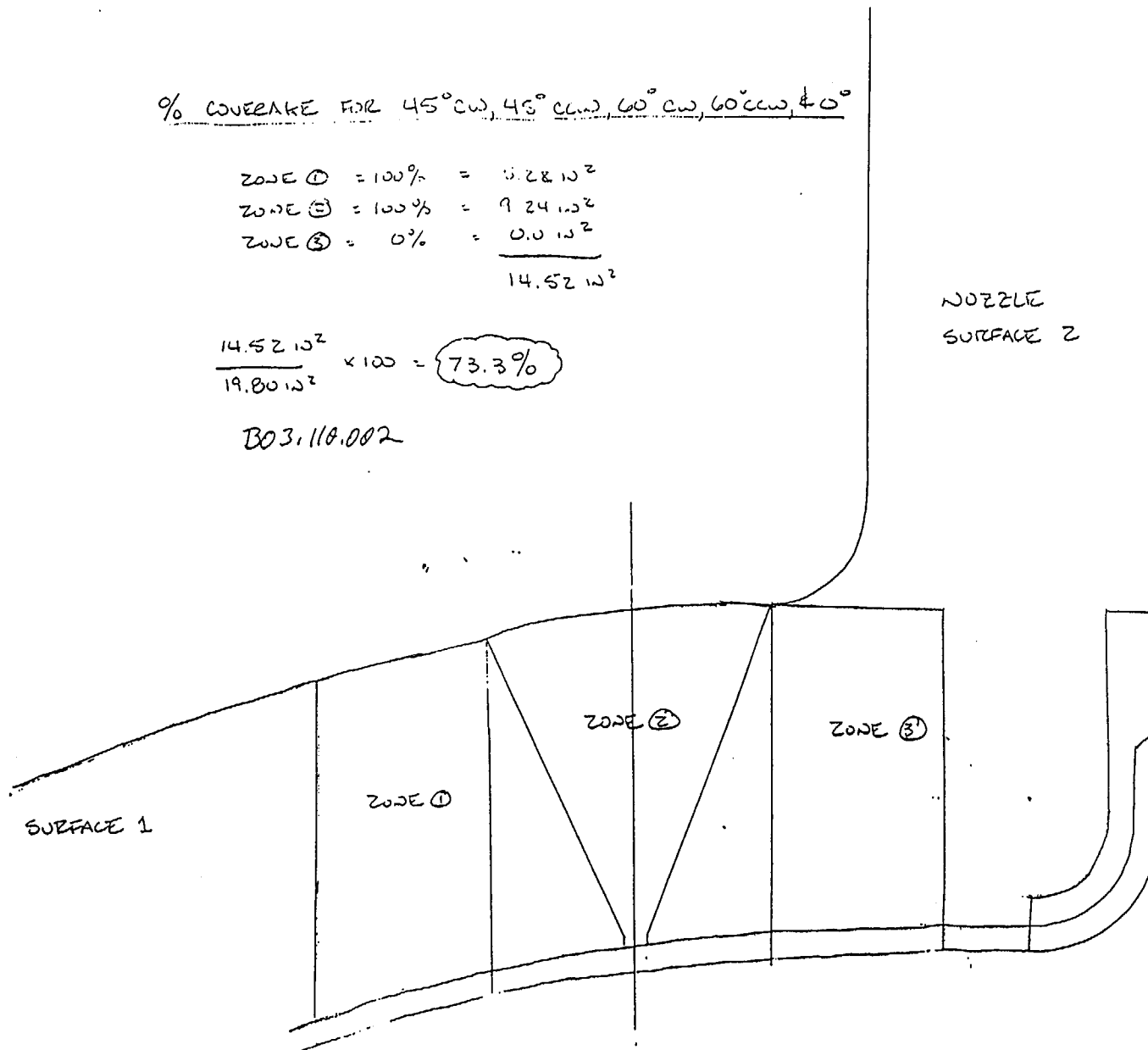
% COVERAGE FOR 45° CW, 45° CCW, 60° CW, 60° CCW, 40°

$$\begin{aligned} \text{ZONE ①} &= 100\% = 5.28 \text{ m}^2 \\ \text{ZONE ②} &= 100\% = 9.24 \text{ m}^2 \\ \text{ZONE ③} &= 0\% = 0.0 \text{ m}^2 \\ &\hline 14.52 \text{ m}^2 \end{aligned}$$

$$\frac{14.52 \text{ m}^2}{19.80 \text{ m}^2} \times 100 = 73.3\%$$

B03.118.002

NOZZLE
SURFACE 2



TO 60 FROM SURFACE

AREA LOST WITH 45°

$$\frac{2.1512 \times 2.012}{2} = 2.1512$$

AREA COVERED WITH 45°

$$19.8012^2 - 2.1512^2 = 17.6512^2$$

$$\% \text{ COVERAGE } 45^\circ = \frac{17.6512^2}{19.8012^2} \times 100 = \boxed{89.1\%}$$

AREA LOST WITH 60°

$$\frac{2.1512 \times 1.112}{2} = 1.1812^2$$

AREA COVERED WITH 60°

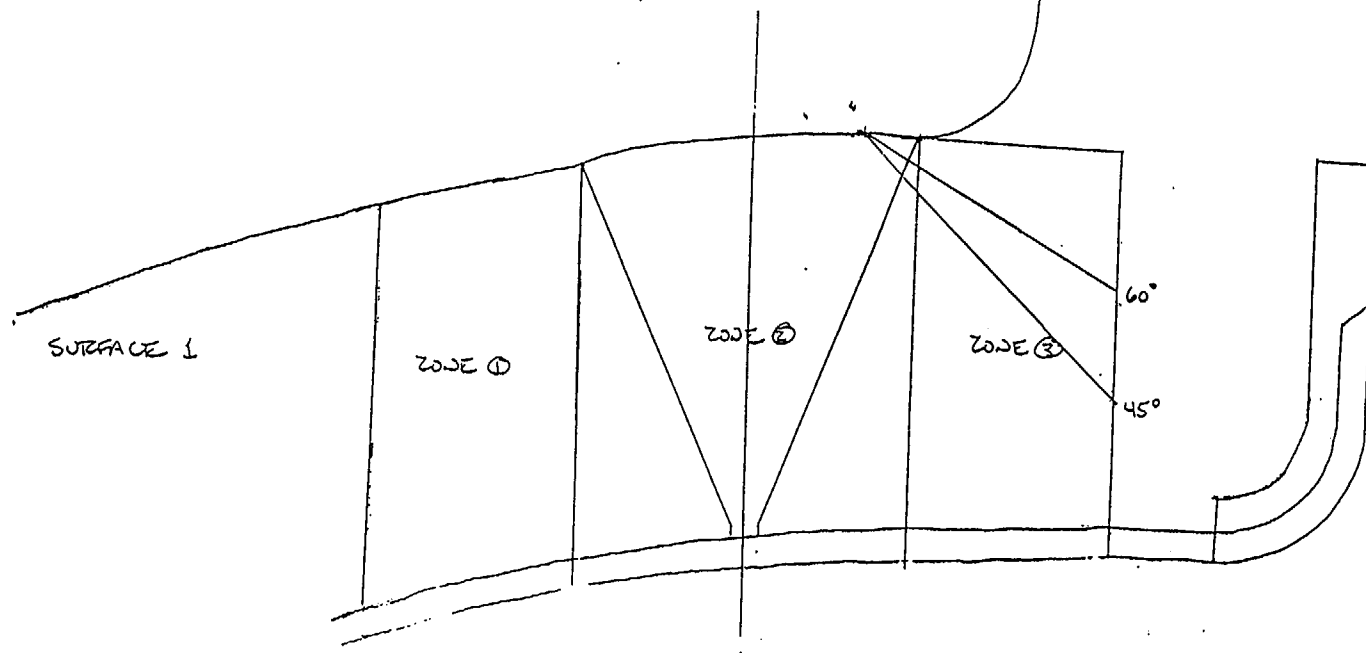
$$19.8012^2 - 1.1812^2 = 18.6212^2$$

$$\% \text{ COVERAGE } 60^\circ = \frac{18.6212^2}{19.8012^2} \times 100 = \boxed{94.0\%}$$

NOZZLE
SURFACE
2

SERIAL NO 98-001
ATTACHMENT 3
PAGE 8 of 34

B03.110.002



% COVERAGE 45° & 60° FROM SURFACE Z

4 5

AREA COVERED WITH 45°

$$\frac{4.012 \times 3.3}{2} = 6.6122$$

$$\frac{6.6122}{19.8122} \times 100 = 33.3\%$$

AREA COVERED WITH 60°

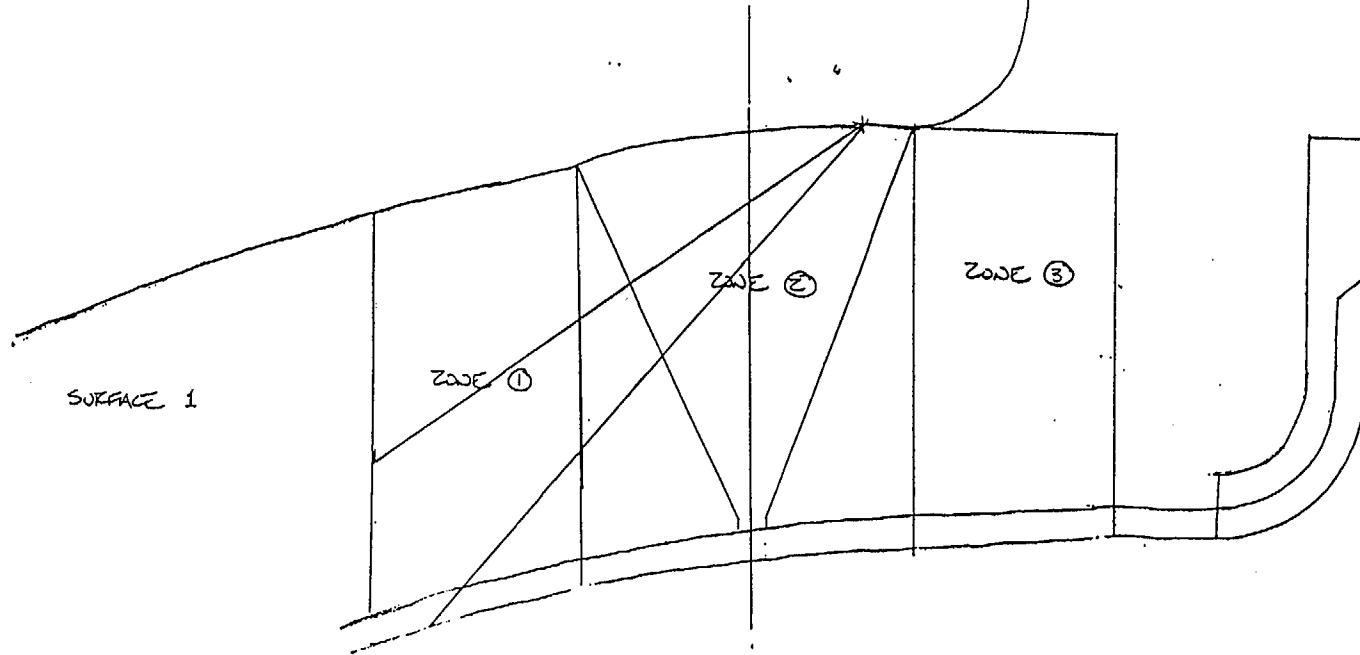
$$\frac{4.012 \times 2.12}{2} = 4.122$$

$$\frac{4.122}{19.8122} \times 100 = 20.2\%$$

NOZZLE
SURFACE Z

1303.110.002

SERIAL NO 98-001
ATTACHMENT 3
PAGE 9 of 39



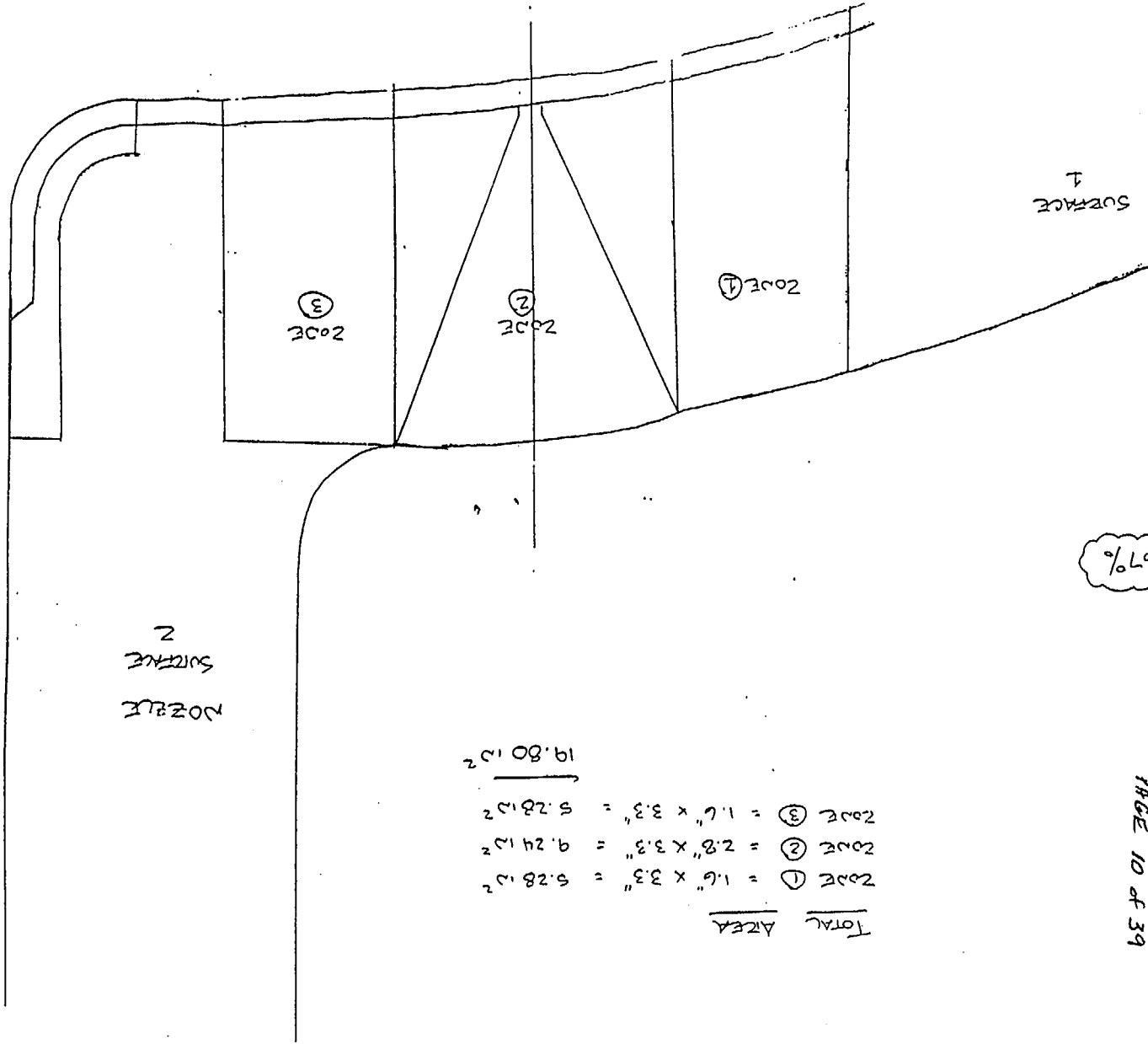
| Coverage | |
|----------|---------|
| 0° | = 73.3% |
| 15° CW | = 73.3% |
| 15° CCW | = 73.3% |
| 45° SI | = 89.1% |
| 45° S2 | = 33.3% |
| 60° CW | = 73.3% |
| 60° CCW | = 73.3% |
| 60° SI | = 94.0% |
| 90° S2 | = 20.2% |

B03.110.002

$\frac{603.1}{9} = 67\%$

SERIAL NO. 98-001
ATTACHMENT 3
PAGE 10 of 39

| Total Area | |
|----------------------|-------------------------------------|
| Zone ① | = 1.6" x 3.3" = 5.28 m ² |
| Zone ② | = 2.8" x 3.3" = 9.24 m ² |
| Zone ③ | = 1.6" x 3.3" = 5.28 m ² |
| <hr/> | |
| 19.80 m ² | |



505

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1216

Form NDE-UT-

Exam Finish: 1323

Revision 4

Station: MCGUIRE

Unit: 1

Component/Weld ID: 1PZR-15

Date: 8-24-94

Weld Length (in.): 47.0"

Surface Condition: BUFFED

Lo: 9.2.3

Surface Temperature: 90 ° F

Examiner: *W.C. Leaper* Level: *II*

Scans:

Pyrometer S/N: MCNDE-27023

Examiner: Level:

45 ☒ 47 dB 70 ☐ dB

Cal Due: 10/14/94

Procedure: NDE-621 Rev: 1 FC: N/A

45T ☐ dB 70T ☐ dB

Configuration: NOZZLE

Calibration Sheet No: 9401046
9401047
9401048

60 ☒ 50 dB

1 Flow 2

PZR to NOZZLE


60T ☐ dB

Scan Surface: OD

Other: 0° 20 dB

Applies to NDE-680 only

Skew Angle:

| IND # |  | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|---|-----------------|--------------------------|----------|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------|---------------------|------------------------|-------|
| | DO NOT WRITE IN THIS SPACE | | | | | 20%dac HMA 50%dac 100% dac | 20%dac HMA 50%dac 100% dac | 20%dac HMA 50%dac 100% dac | 20%dac HMA 50%dac 100% dac | 20%dac HMA 50%dac 100% dac | 20%dac HMA 50%dac 100% dac | DO IN | NOT THIS | WRITE SPACE | |
| | 0° | | NO RECORDABLE INDICATION | | | | | | | | | | | | |
| | 45° | | NO RECORDABLE INDICATION | | | | | | | | | | | | |
| | 60° | | NO RECORDABLE INDICATION | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐

no ☒

Sheet ____ of ____

Reviewed By:

Level: *II*

Date: *8/31/94*

Authorized Inspector

Date: *9-28-94*

Item No:

B03.110.005

SERIAL NO. 78-001
ATTACHMENT 3
PAGE 11 of 29

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1PZR-15 Item No: B03.110.005

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw
 FROM L _____ to L _____ INCHES FROM WO 1.4" to BEYOND
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other _____ FROM 0 DEG to 360 DEG

DUE TO 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: W.C. Leaper

Level: II

Date: 8-24-94

Sheet _____ of _____

Reviewed By: C.D. Jolley

Date: 8/31/94

Authorized Inspector: [Signature]

Date: 9-28-94

SEE/AC No. 98-001
 ATTACHMENT 3
 PAGE 12 of 39

Limited Exam Data Sheet

Station McGuire Unit 1 I.D. # 1PZR-15
By W. C. Leeper Date 8-24-94 Item # B03.110.005
Checked By _____ Date _____ Page _____ Of _____

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area _____ x (Number of Scans) _____ = _____ (% Factor)

Vessels:

Area Loss : Zone #1 _____
Zone #2 _____
Zone #3 _____

Total Zone Loss _____ / (% Factor) _____ x 100 = _____ % of Loss

Lump Sum Loss From Other Limitations + _____ %

Total Loss _____ %

100% - (Total Loss) 33% = 67% of Coverage *See Attached*
(Additional _____ % of Partial Coverage) *Sheets*

Qualifies for Request for Relief ☐ Yes ☐ No *1 of 5*

Piping:

Axial Scan _____ (Loss) _____ / _____ (% Factor) x 100 = _____ % of Loss

Circumferential Scan Over Root Area ☐ Yes ☐ No _____ % of Loss

Axial Loss _____ + Circ. Loss _____ = _____ / 2 = _____ % Loss

Additional Losses (Due to hangers, restraints, etc.) + _____ % Loss

Explain: _____ Total % Loss

100% - (Total Loss) _____ = _____ % of Coverage

Qualifies for Request for Relief ☐ Yes ☐ No

Disposition: _____

By: _____ Date: _____

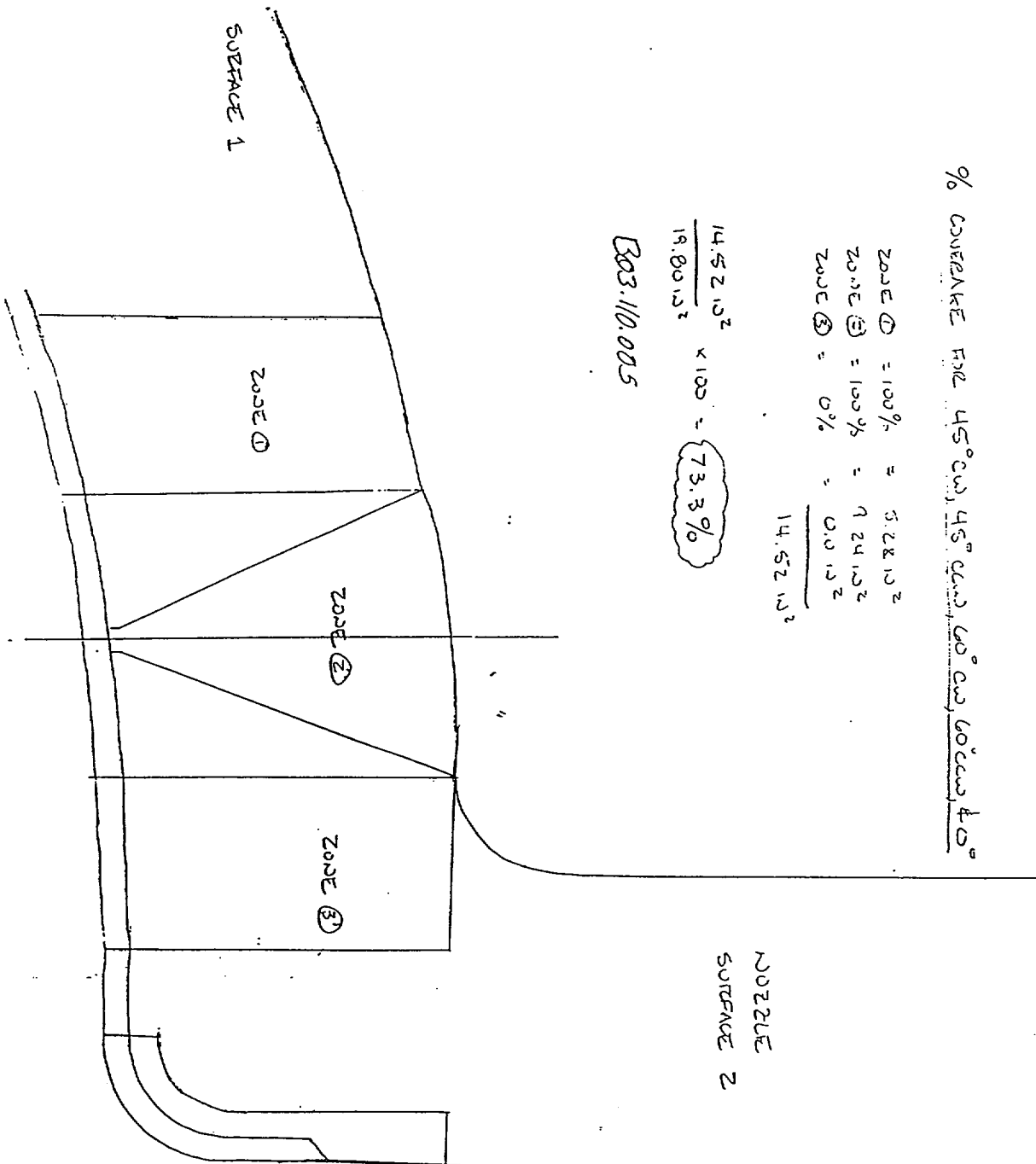
% COVERAKE FOR 45° C.W, 45° C.W, 60° C.W, 60° C.W, 45°

$$\begin{aligned} \text{ZONE ①} &= 100\% = 5.28 \text{ m}^2 \\ \text{ZONE ②} &= 100\% = 9.24 \text{ m}^2 \\ \text{ZONE ③} &= 0\% = 0.0 \text{ m}^2 \end{aligned}$$

$$\frac{14.52 \text{ m}^2}{19.80 \text{ m}^2}$$

$$\frac{14.52 \text{ m}^2}{19.80 \text{ m}^2} \times 100 = 73.3\%$$

Box 110.005



10 COVERAGE 45° & 60° FROM SURFACE

AREA LOST WITH 45°

$$\frac{2.1512 \times 2.012}{2} = 2.1512$$

AREA COVERED WITH 45°

$$19.8012^2 - 2.1512^2 = 17.6512^2$$

$$\% \text{ COVERAGE } 45^\circ = \frac{17.6512^2}{19.8012^2} \times 100 = \boxed{89.1\%}$$

B03.110.005

AREA LOST WITH 60°

$$\frac{2.1512 \times 1.112}{2} = 1.1812^2$$

AREA COVERED WITH 60°

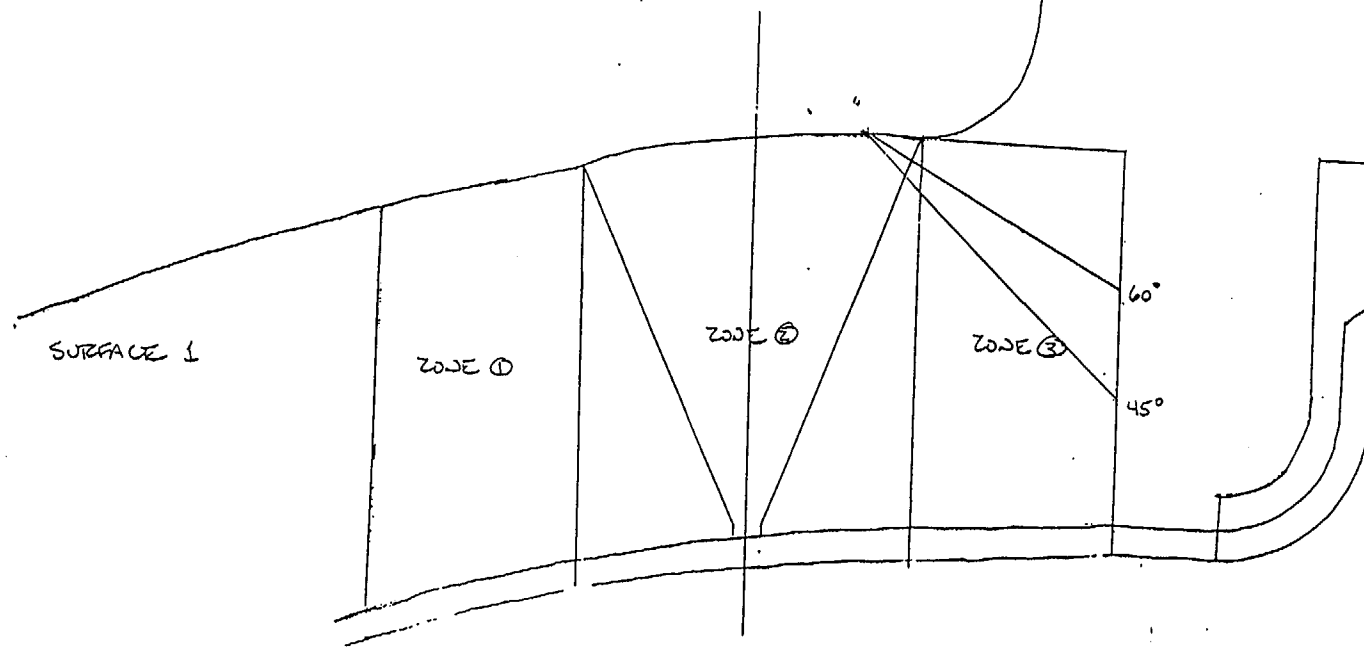
$$19.8012^2 - 1.1812^2 = 18.6212^2$$

$$\% \text{ COVERAGE } 60^\circ = \frac{18.6212^2}{19.8012^2} \times 100 = \boxed{94.0\%}$$

NOZZLE
SURFACE
Z

3 of 5

SERIAL NO. 98-001
ATTACHMENT 3
PAGE 15 of 39



% COVERAGE 45° & 60° FROM SURFACE Z

AREA COVERED WITH 45°

$$\frac{4.012 \times 3.3}{2} = 6.612^2$$

$$\frac{6.612^2}{19.812^2} \times 100 = 33.3\%$$

AREA COVERED WITH 60°

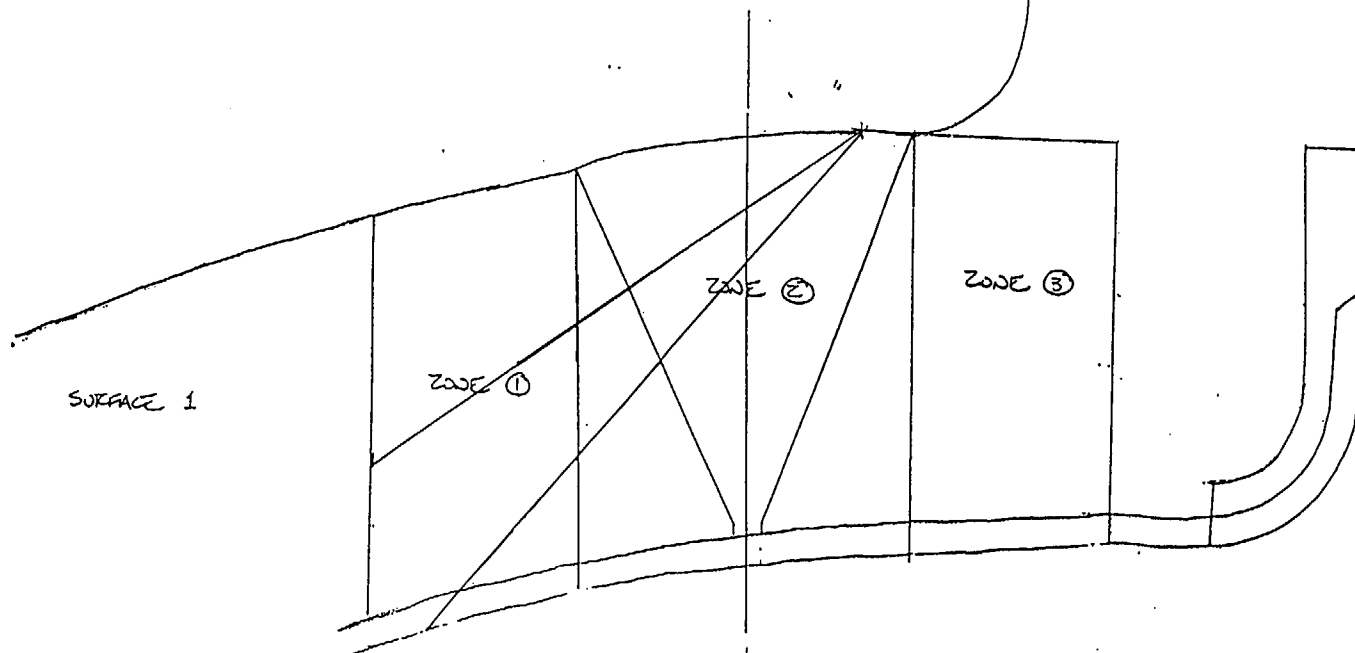
$$\frac{4.012 \times 2.12}{2} = 4.12^2$$

$$\frac{4.12^2}{19.812^2} \times 100 = 20.2\%$$

B03.110.005

NOZZLE
SURFACE Z

4 of 5



SERIAL NO. 98-001
ATTACHMENT 3
PAGE 16 of 39

| TOTAL | COVERAGE |
|---------|----------|
| 0° | = 73.3% |
| 15° CW | = 73.3% |
| 15° CCW | = 73.3% |
| 15° SI | = 89.1% |
| 15° SZ | = 33.3% |
| 60° CW | = 73.3% |
| 60° CCW | = 73.3% |
| 60° SI | = 94.0% |
| 60° SZ | = 20.2% |

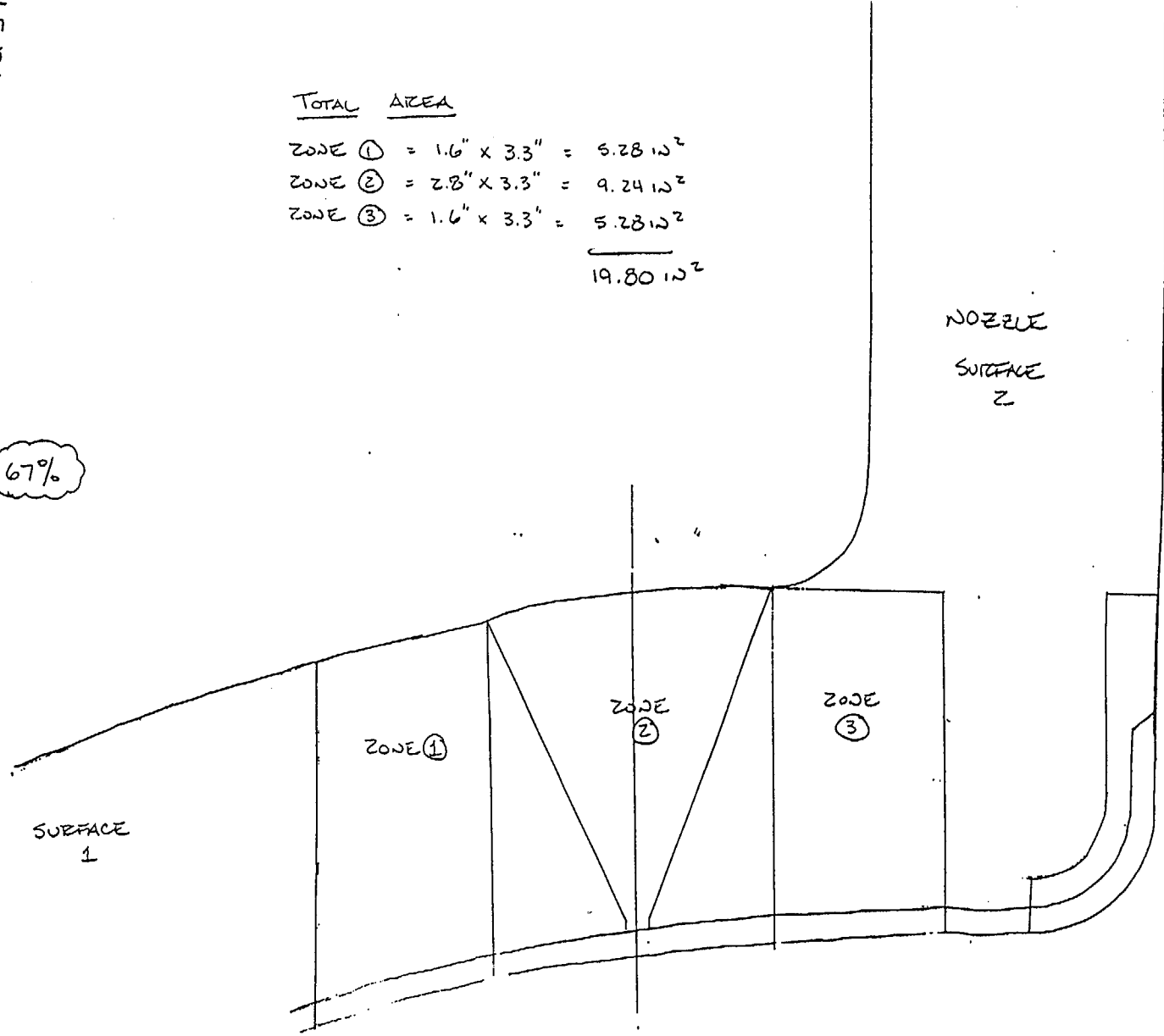
SERIAL NO. 98
ATTACHMENT 3
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TOTAL AREA

ZONE ① = 1.6" x 3.3" = 5.28 12²
 ZONE ② = 2.8" x 3.3" = 9.24 12²
 ZONE ③ = 1.6" x 3.3" = 5.28 12²
19.80 12²

$603.1 \div 9 = 67\%$

B03.110.005



DUKE POWER COMPANY

Exam Start: 1222

Form NDE-UT

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Finish: 1333

Revision 4

Station: MCGUIRE

Unit: 1

Component/Weld ID: 1PZR-16

Date: 8-24-94

Weld Length (in.): 47.1"

Surface Condition: BUFFED

Lo: 9.2.3

Surface Temperature: 90 ° F

Examiner: *W.C. Leaper* Level: *II*

Scans:

Pyrometer S/N: MCNDE-27023

Examiner: Level:

45 ☒ 47 dB 70 ☐ dB

Cal Due: 10/14/94

Procedure: NDE-621 Rev: 1 FC: NA

45T ☐ dB 70T ☐ dB

Configuration: NOZZLE

Calibration Sheet No: 9401046
9401047
9401048

60 ☒ 50 dB

1 Flow 2

PZR to NOZZLE


60T ☐ dB

Scan Surface: OD

Applies to NDE-680 only

Other: 0° 20 dB

Skew Angle:

| IND # |  | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|---|-----------|--------|-------|-------|--------------------------|------------|------------|------------|------------|------------|----------|----------------------------|------|-------|
| | DO NOT WRITE IN THIS SPACE | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | DO NOT WRITE IN THIS SPACE | | |
| | | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | 0° | | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | 45° | | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | 60° | | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐ no ☒

Sheet of

Reviewed By:

Level:

Date:

Authorized Inspector

Date

Item No:

C.D. Jolley

II

8/31/94

[Signature]

9-28-94

B03.110.006

SERIAL NO. 98-001
ATTACHMENT 3
PAGE 18439

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1PZR-16 Item No: B03.110.006

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw
 FROM L_____to L_____ INCHES FROM WO 1.4" to BEYOND
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other _____ FROM 0 DEG to 360 DEG

DUE TO 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

Sketch(s) attached

☒ yes

☐ no

Prepared By: W.C. Leaper

Level: II

Date: 8/24/94

Sheet _____ of _____

Reviewed By: C.D. Jarley

Date: 8/31/94

Authorized Inspector:

[Signature]

Date: 9/28/94

SERIAL NO. 98-001
 ATTACHMENT 3
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Limited Exam Data Sheet

Station McGuire Unit 1 I.D. # 1PZR-16
By W.C. Leaper Date 8-24-94 Item # B03.110.008
Checked By C.D. Jolley Date 8/31/94 Page Of

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area x (Number of Scans) = (% Factor)

Vessels:

Area Loss : Zone #1
 Zone #2
 Zone #3

Total Zone Loss / (% Factor) x 100 = % of Loss

Lump Sum Loss From Other Limitations + %

Total Loss %

100% - (Total Loss) 33% = 67% of Coverage *See Attached*
(Additional % of Partial Coverage) *Sheets*

Qualifies for Request for Relief ☒ Yes ☐ No *1 of 5*

Piping:

Axial Scan (Loss) / (% Factor) x 100 = % of Loss

Circumferential Scan Over Root Area ☐ Yes ☐ No % of Loss

Axial Loss + Circ. Loss = / 2 = % Loss

Additional Losses (Due to hangers, restraints, etc.) + % Loss

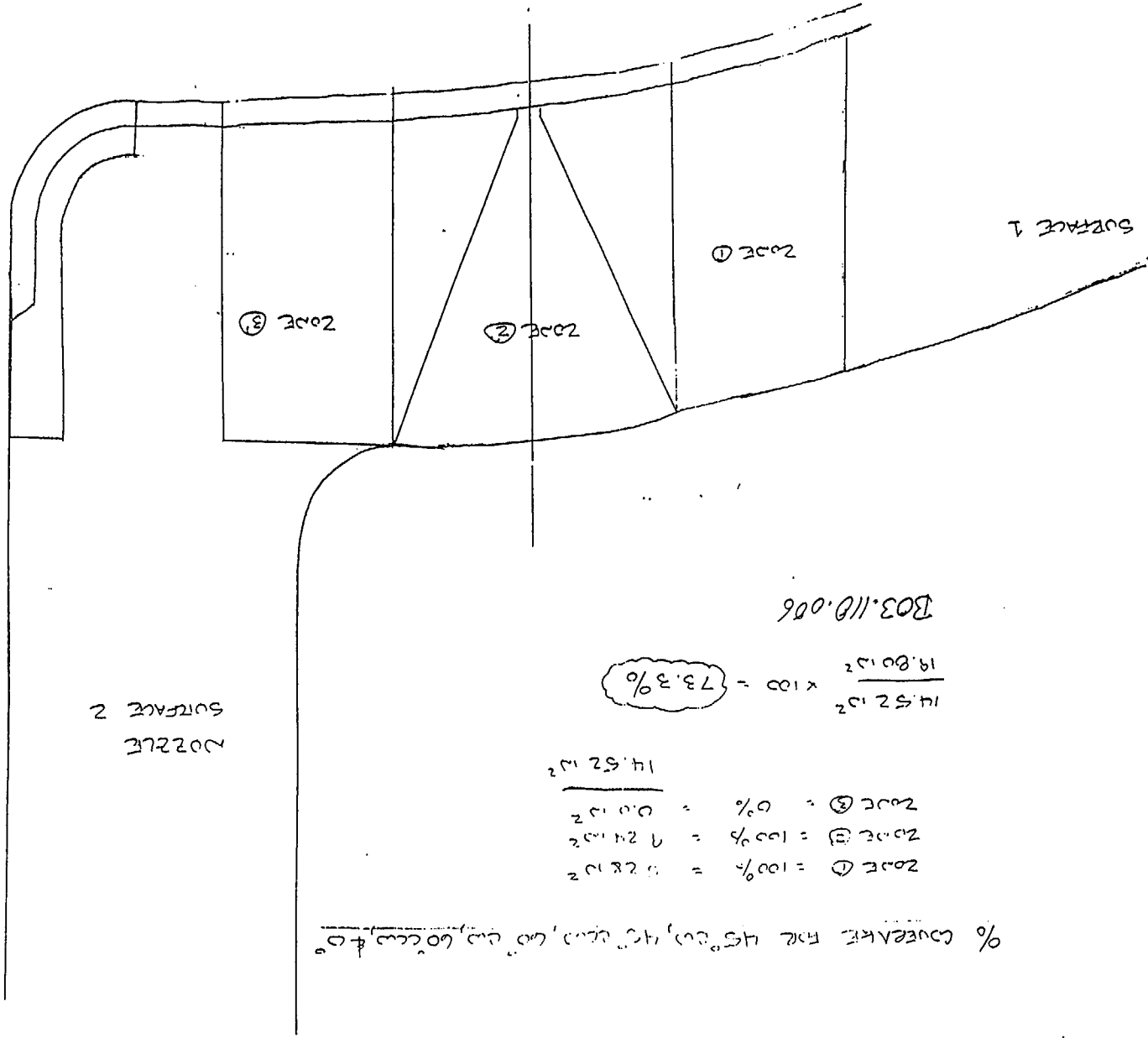
Explain: Total % Loss

100% - (Total Loss) = % of Coverage

Qualifies for Request for Relief ☐ Yes ☐ No

Disposition:

By: Date:



B03.110.006

$$\frac{14.52 \text{ m}^2}{19.80 \text{ m}^2} \times 100 = 73.3\%$$

$$\frac{14.52 \text{ m}^2}{19.80 \text{ m}^2} = 73.3\%$$

% COVERAGE FOR 45° (0.45°), 45° (0.45°), 45° (0.45°), 45° (0.45°)

SURFACE 2

2045

SURFACE 1

Zone 1

Zone 2

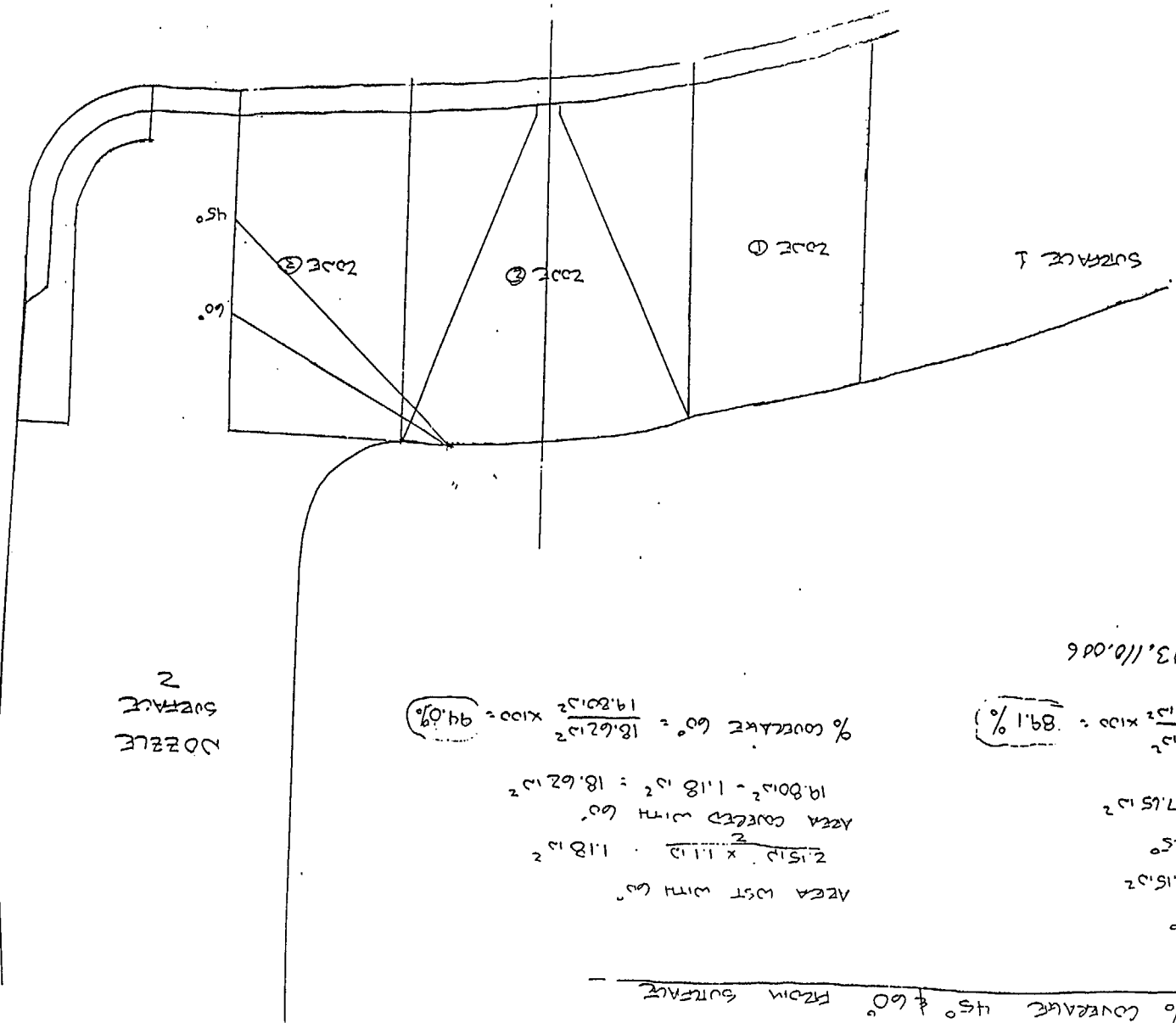
Zone 3

AREA LOST WITH 45°
 $\frac{2.1512 \times 2.012}{2} = 2.1612$
 AREA COVERED WITH 45°
 $19.8012^2 - 2.1612^2 = 17.6512$
 $\% \text{ COVERAGE } 45^\circ = \frac{17.6512}{19.8012} \times 100 = 89.1\%$

B03.110.006

AREA LOST WITH 60°
 $\frac{2.1512 \times 1.112}{2} = 1.1812$
 AREA COVERED WITH 60°
 $19.8012^2 - 1.1812^2 = 18.6212$
 $\% \text{ COVERAGE } 60^\circ = \frac{18.6212}{19.8012} \times 100 = 94.0\%$

% COVERAGE 45° & 60° FROM SURFACE



3 of 5

SERIAL NO. 98-001
ATTACHMENT 3
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B03.110.006

% COVERAGE 45° & 60° FROM NOZZLE

AREA COVERED WITH 45°

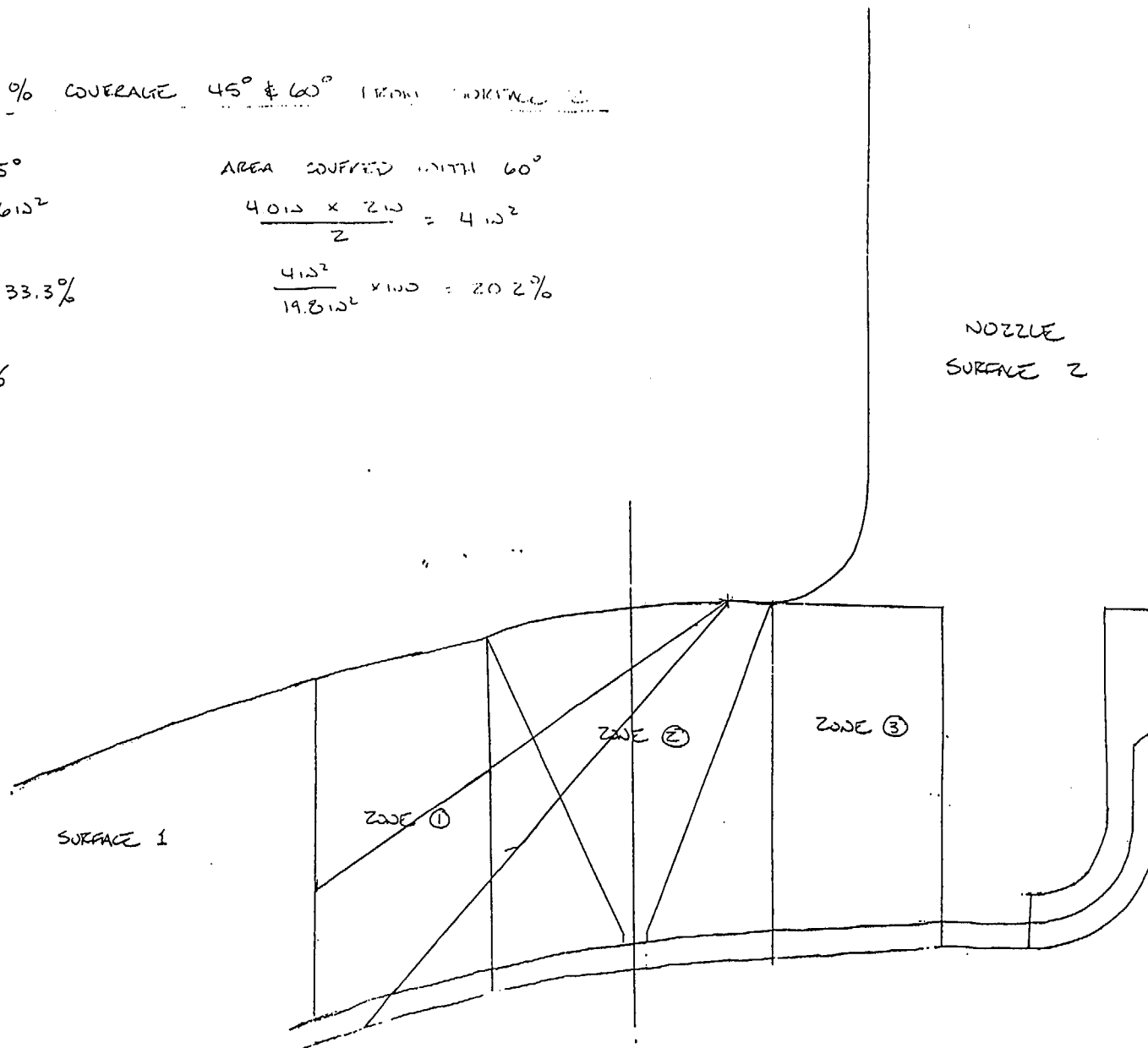
$$\frac{4.012 \times 3.3}{2} = 6.612$$

$$\frac{6.612}{19.812} \times 100 = 33.3\%$$

AREA COVERED WITH 60°

$$\frac{4.012 \times 2.12}{2} = 4.12$$

$$\frac{4.12}{19.812} \times 100 = 20.2\%$$



4 of 5

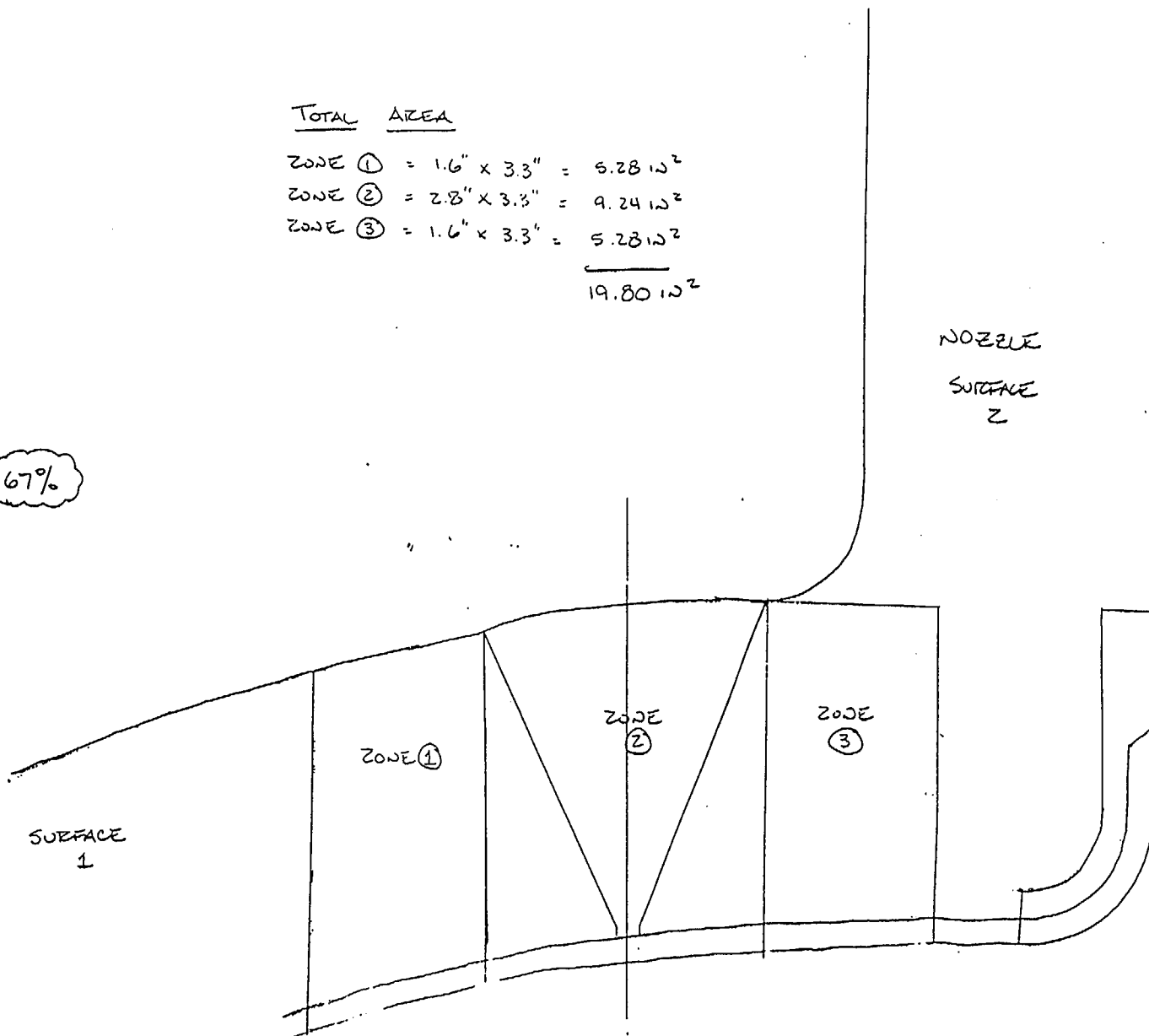
| <u>TOTAL</u> | <u>COVERAGE</u> |
|--------------|-----------------|
| 1° | = 73.3% |
| 5° CW | = 73.3% |
| 5° CCW | = 73.3% |
| 5° SI | = 89.1% |
| 5° SZ | = 33.3% |
| 0° CW | = 73.3% |
| 0° CCW | = 73.3% |
| 0° SI | = 94.0% |
| 0° SZ | = 20.2% |

$$603.1 \div 9 = 67\%$$

1303.110.006

TOTAL AREA

$$\begin{aligned} \text{ZONE ①} &= 1.6" \times 3.3" = 5.28 \text{ m}^2 \\ \text{ZONE ②} &= 2.8" \times 3.3" = 9.24 \text{ m}^2 \\ \text{ZONE ③} &= 1.6" \times 3.3" = 5.28 \text{ m}^2 \\ \hline &19.80 \text{ m}^2 \end{aligned}$$



5 of 5

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1300

Form NDE-UT-

Exam Finish: 1341

Revision 4

Station: MCGUIRE

Unit: 1

Component/Weld ID: 1PZR-12R

Date: 8-24-94

Weld Length (in.): 40.0"

Surface Condition: BUFFED

Lo: 9.2.3

Surface Temperature: 90 ° F

Examiner: *W. C. Leeper* Level: *II*

Scans:

45 ☐ dB 70 ☒ 61 dB

Pyrometer S/N: MCNDE-27023

Examiner: Level:

45T ☐ dB 70T ☐ dB

Cal Due: 10/14/94

Procedure: NDE-681

Rev: 0

FC: N/A

Configuration: NOZZLE

1 Flow 2

PZR to NOZZLE

Calibration Sheet No:

9401049

9401050

60 ☒ 58 dB

Scan Surface: OD

60T ☐ dB

Applies to NDE-680 only

Other: dB

Skew Angle: 14°

| IND # | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|----------------------------|--------------------------|-------|-------|------------|------------|------------|------------|------------|------------|----------------------------|------------|------|-------|
| | DO NOT WRITE IN THIS SPACE | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | DO NOT WRITE IN THIS SPACE | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | 60° | NO RECORDABLE INDICATION | | | | | | | | | | | | |
| | 70° | NO RECORDABLE INDICATION | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐

no ☒

Sheet of

Reviewed By:

Level: *II*

Date:

Authorized Inspector

Date

Item No:

B03.120.002

Serial No. 98-001
Attachment 3
Page 25 of 39

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1PZR-12R Item No: B03.120.002

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L _____ to L _____ INCHES FROM WO _____ OF RADIUS to _____ BEYOND
 ANGLE: ☐ 0 ☐ 45 ☒ 60 other 70° FROM 0 DEG to 360 DEG

DUE TO 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

Sketch(s) attached

☒ yes

☐ no

Prepared By: W.C. Leeper

Level: II

Date: 8-24-94

Sheet _____ of _____

Reviewed By: C.D. Fuley

Date: 8/31/94

Authorized Inspector: [Signature]

Date: 9-28-94

SERIAL NO. 98-001
 ATTACHMENT 3
 PAGE 26 of 39

Limited Exam Data Sheet

Station McGuire Unit 1 I.D. # 1PZR-12R
By W.C. Leeper Date 8-24-94 Item # B03.120.002
Checked By C.D. Jolley Date 8/31/94 Page Of

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area NA x (Number of Scans) = NA (% Factor)

Vessels:

Area Loss : Zone #1 NA
Zone #2 NA
Zone #3 NA

Total Zone Loss .65 / (% Factor) 1.75 x 100 = 37 % of Loss

Lump Sum Loss From Other Limitations + 0 %

Total Loss 37 %

100% - (Total Loss) 37% = 63 % of Coverage *See Attached sheet*
(Additional % of Partial Coverage)

Qualifies for Request for Relief ☒ Yes ☐ No

Piping:

Axial Scan (Loss) / (% Factor) x 100 = % of Loss

Circumferential Scan Over Root Area ☐ Yes ☐ No % of Loss

Axial Loss + Circ. Loss = / 2 = % Loss

Additional Losses (Due to hangers, restraints, etc.) + % Loss

Explain: Total % Loss

100% - (Total Loss) = % of Coverage

Qualifies for Request for Relief ☐ Yes ☐ No

Disposition:

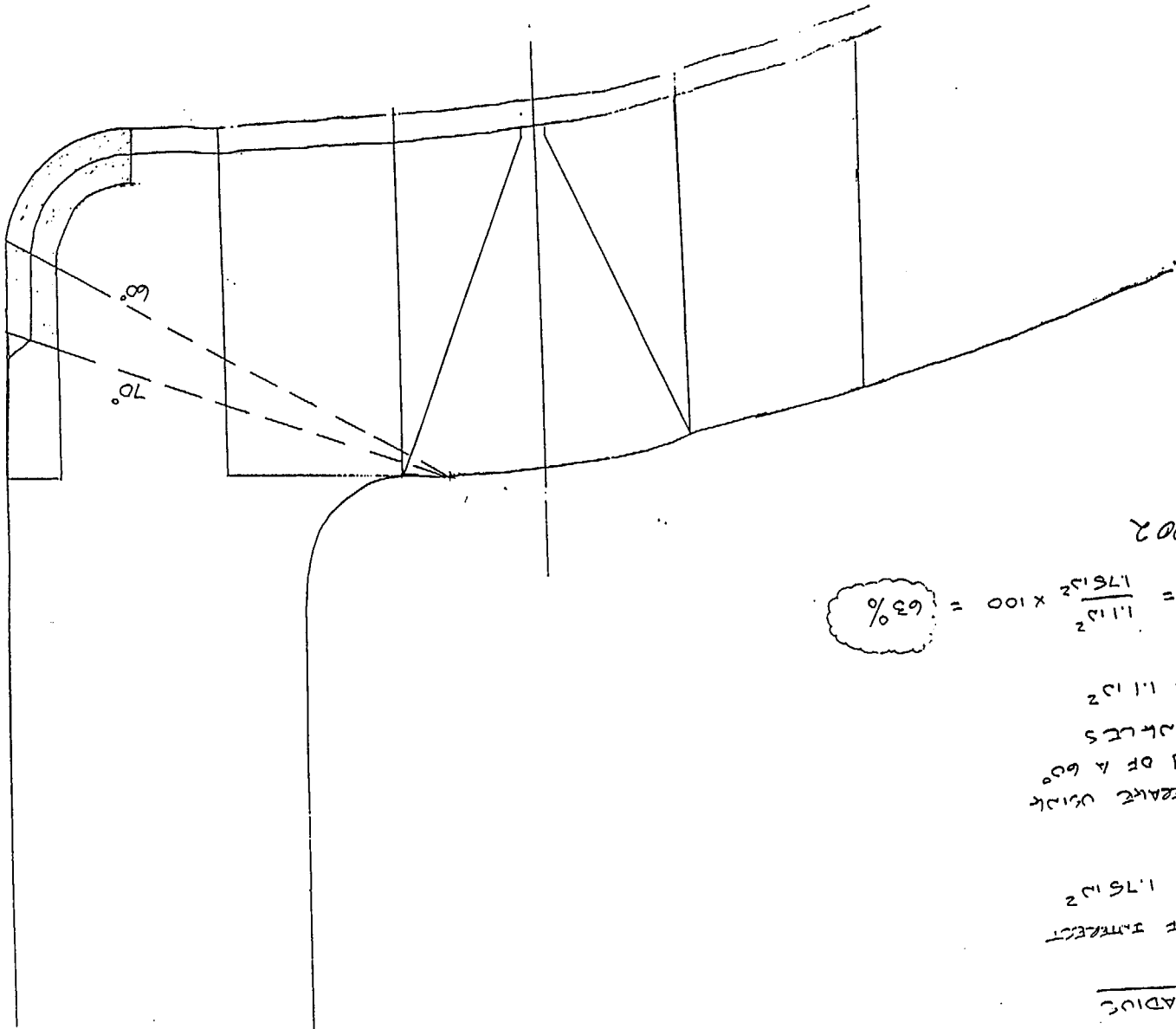
By: Date:

TOTAL AREA OF INTEREST
3.5" x 5" = 1.75152

AREA OF COVERAGE USING
A COMBINATION OF A 60°
E 70° BEAM ANGLE
2.2" x 5" = 1.1152

$$\% \text{ COVERAGE} = \frac{1.1152}{1.75152} \times 100 = 63\%$$

B03, 120,002



DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1312

Form NDE-UT-4

Exam Finish: 1349

Revision 4

Station: MCGUIRE

Unit: 1

Component/Weld ID: 1PZR-15R

Date: 8-24-94

Weld Length (in.): 47.1"

Surface Condition: BUFFED

Lo: 9.2.3

Surface Temperature: 90 ° F

Examiner: *W.C. Leeper* Level: *II*

Scans:

Pyrometer S/N: MCNDE-27023

Examiner: _____ Level: _____

45 ☐ _____ dB 70 ☒ 61 dB

Cal Due: 10/14/94

Procedure: NDE-681

Rev: 0

FC: N/A

45T ☐ _____ dB 70T ☐ _____ dB

Configuration: NOZZLE

Calibration Sheet No:

9401049
9401050

60 ☒ 58 dB

1 Flow 2

PZR to NOZZLE

60T ☐ _____ dB

Scan Surface: OD

Other: _____ dB

Applies to NDE-680 only

Skew Angle: 14°

| IND # | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|-----------|--------|-------|-------|--------------------------|------------|------------|------------|------------|------------|----------|------------|------|-------|
| | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | 60° | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | 70° | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐ no ☒

Sheet _____ of _____

Reviewed By:

Level: *II*

Date: *8/31/94*

Authorized Inspector

Date: *9-28-94*

Item No:

B03.120.005

SERIAL NO. 98-001
ATTACHMENT 3
PAGE 29 of 39

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- U 1

Revision 1

Component/Weld ID: 1PZR-15R Item No: B03.120.005

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L _____ to L _____ INCHES FROM WO START OF RADIUS to BEYOND
 ANGLE: ☐ 0 ☐ 45 ☒ 60 other 70° FROM 0 DEG to 360 DEG

DUE TO 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

Sketch(s) attached

☒ yes

☐ no

Prepared By: W.C. Leaper

Level: II

Date: 8-29-94

Sheet _____ of _____

Reviewed By: C.D. Jolley II

Date: 8/31/94

Authorized Inspector: [Signature]

Date: 9-28-94

SENAL NO. 98-001
 ATTACHMENT 3
 PAGE 3D of 39

Limited Exam Data Sheet

Station McGuire Unit 1 I.D. # 1PZR-15R
By W.C. Leeper Date 8-24-94 Item # B03.120.005
Checked By C.D. Jolley Date 8/31/94 Page Of

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area 1/1 x (Number of Scans) = N/A (% Factor)

Vessels:

Area Loss : Zone #1 N/A
Zone #2 N/A
Zone #3 N/A

Total Zone Loss 6.5 / (% Factor) 1.25 x 100 = 37 % of Loss

Lump Sum Loss From Other Limitations + 0 %

Total Loss 37 %

100% - (Total Loss) 37% = 63 % of Coverage *See Attached Sheet*
(Additional % of Partial Coverage)

Qualifies for Request for Relief ☒ Yes ☐ No 1 of 2

Piping:

Axial Scan (Loss) / (% Factor) x 100 = % of Loss

Circumferential Scan Over Root Area ☐ Yes ☐ No % of Loss

Axial Loss + Circ. Loss = / 2 = % Loss

Additional Losses (Due to hangers, restraints, etc.) + % Loss

Explain: Total % Loss

100% - (Total Loss) = % of Coverage

Qualifies for Request for Relief ☐ Yes ☐ No

Disposition:

By: Date:

INNER RADIUS

TOTAL AREA OF INTEREST

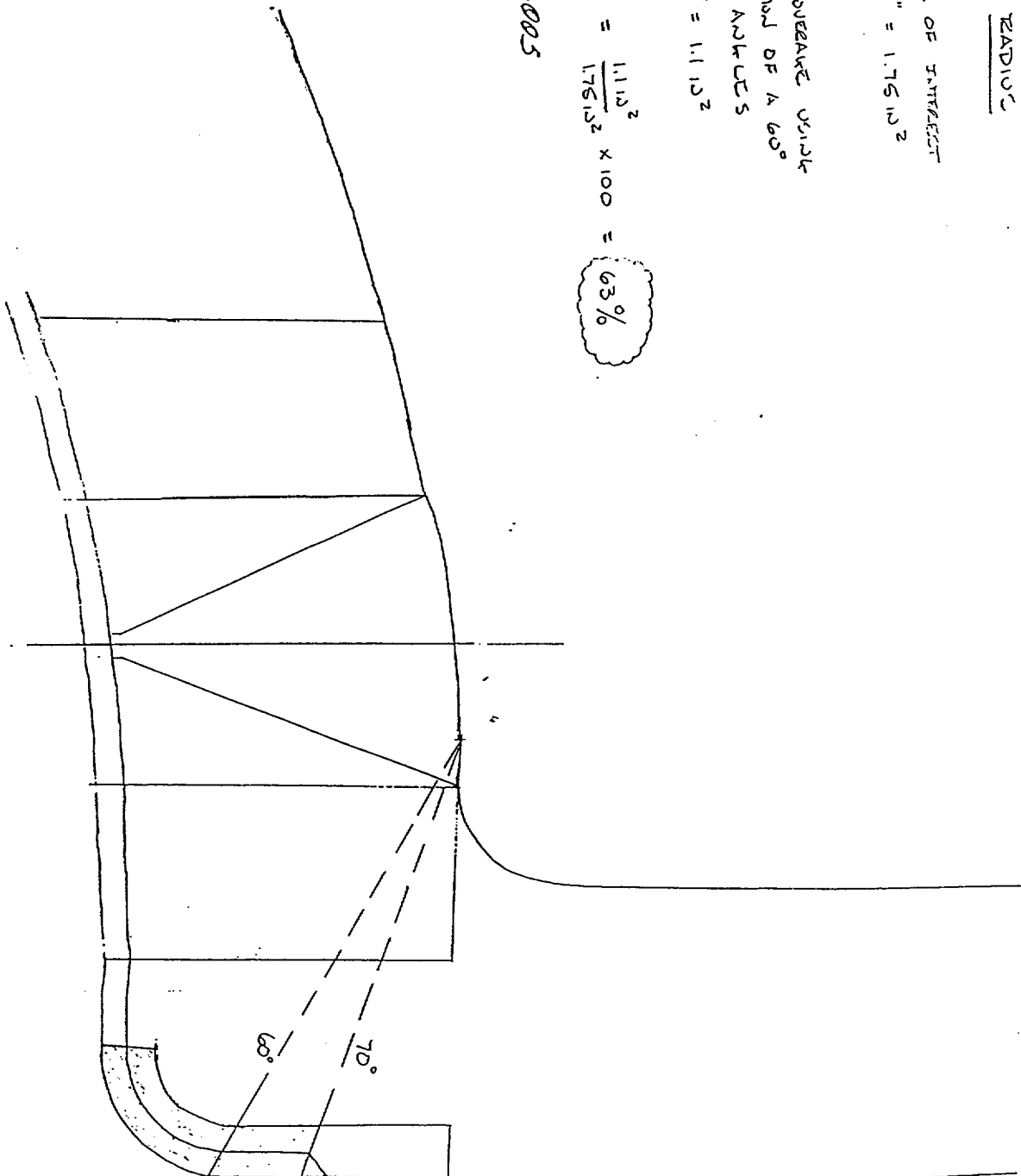
$$3.5" \times 5" = 1.75 \text{ in}^2$$

AREA OF COVERAGE UNDER
A COMBINATION OF A 60°
E 70° BEAM ANGLES

$$2.2" \times 5" = 1.1 \text{ in}^2$$

$$\% \text{ COVERAGE} = \frac{1.1 \text{ in}^2}{1.75 \text{ in}^2} \times 100 = 63\%$$

B03.120.005



DUKE POWER COMPAN.

FORM NDE-U1-1E

ULTRASONIC CALIBRATION SHEET FOR USK-7D INSTRUMENTS

REVISION 2

| | | | |
|------------------------------|------------------|------------------------------------|-----------------------------------|
| Station: MCGUIRE | Unit: 1 | Date: 8-24-94 | Sheet Number: 9401050 |
| Procedure: NDE681 | Rev: 0 | F/C: N/A | Couplant: ULTRAGEL |
| Examiner: <u>W.C. Leaper</u> | Level: <u>II</u> | Calibration Block ID: <u>50338</u> | Pyrometer S/N: <u>MCNDE-27023</u> |
| Examiner: | Level: | Calibration Block Temp: 90°F | Cal. due: 10-14-94 |

| | | | |
|-----------------------------|----------------------|---|-------------------------------|
| REFERENCE BLOCK | | SIMULATOR BLOCK | |
| ID: <u>91-5861</u> | | ID: <u>91-5861</u> | Reflector Type: <u>RADIUS</u> |
| Type: <u>ROMPAS</u> | Material: <u>C/S</u> | Gain: <u>34 DB</u> | Signal Amp: <u>40 %</u> |
| | | Metal Path: <u>4.9"</u> | |
| INSTRUMENT | | TRANSDUCER | |
| Manufacturer: Krautkramer | | Type: Single <input checked="" type="checkbox"/> Dual <input type="checkbox"/> Size: <u>1.0"</u> Freq: <u>2.25</u> Mhz Wedge <u>AWS</u> | |
| Serial No: <u>32810-797</u> | | Manufacturer: <u>AEROTECH</u> Ser no: <u>M18423</u> Meas. <u>Δ</u> <u>69°</u> | |

| | | | | | | | |
|--|--------------|--|-----------|---|--|---|------------|
| INSTRUMENT SETTINGS | | CALIBRATION | | METHOD | | CABLES | |
| Gain | <u>47DB</u> | Reflector Type | Amplitude | Metal Path | | RG58 <input type="checkbox"/> | |
| Range | <u>15.0"</u> | HOLE | %FSH | inches | | RG174 <input checked="" type="checkbox"/> | |
| MTVEL | <u>128.6</u> | 1 /8 node | 80% | 2.5" | | Length: <u>6'</u> | |
| Delay | <u>17.0</u> | 2 /8 node | 42% | 4.90" | | Initial Cal Time | |
| Pulser | <u>HIGH</u> | 3 /8 node | 30% | 7.20" | | <u>0955</u> | |
| Reject | <u>OFF</u> | /8 node | | | | Cal Checks | |
| Freq | <u>1-5</u> | other | | | | Time | Initials |
| Zero | <u>16.09</u> | Cal Direction: axial <input checked="" type="checkbox"/> circ. <input checked="" type="checkbox"/> | | | | <u>1334</u> | <u>WCL</u> |
| Display | <u>FULL</u> | Wave Mode: Long. <input type="checkbox"/> shear <input checked="" type="checkbox"/> | | | | <u>1445</u> | <u>WCL</u> |
| PRF | <u>HIGH</u> | surf. <input type="checkbox"/> | | | | FINAL | |
| Jack: T <input type="checkbox"/> R <input checked="" type="checkbox"/> | | Remarks: | | 1 Major Screen Div = <u>1.0"</u> inches | | | |
| Item No: B03.120.002, B03.120.005, B03.120.006 | | | | | | | |

| | | | | |
|------------------------------|------------------|----------------------|--|----------------------|
| Reviewer: <u>C.D. Jolley</u> | Level: <u>II</u> | Date: <u>8/31/94</u> | Authorized Inspector: <u>W.C. Leaper</u> | Date: <u>9-28-94</u> |
|------------------------------|------------------|----------------------|--|----------------------|

SERIAL NO. 98-001
ATTACHMENT 3
PAGE 33 OF 39

DUKE POWER COMPAN.

ULTRASONIC CALIBRATION SHEET FOR USK-7D INSTRUMENTS

FORM NDE-U. .E

REVISION 2

Station: MCGUIRE

Unit: 1

Date: 8-24-94

Sheet Number: 9401049

Procedure: NDE681

Rev: 0

F/C: N/A

Couplant: ULTRAGEL

Batch Number: 093001

Examiner: *Winifred C. Leaper*Level: *II*

Calibration Block ID: 50338

Pyrometer S/N: MCNDE-27023

Examiner:

Level:

Calibration Block Temp: 90°F

Cal. due: 10-14-94

REFERENCE BLOCK

ID: 91-5861

SIMULATOR BLOCK

Type: ROMPAS

Material: C/S

ID: 91-5861

Reflector Type: RADIUS

Gain: 44 DB

Signal Ampl: 43 %

Metal Path: 8.0"

INSTRUMENT

Manufacturer: Krautkramer

TRANSDUCER

Serial No: 32810-797

Type: Single ☒ Dual ☐ Size: 1.0" Freq: 2.25 Mhz Wedge AWS

Manufacturer: AEROTECH Ser no: E24907

Meas. *Δ* 61°

INSTRUMENT SETTINGS

CALIBRATION

METHOD

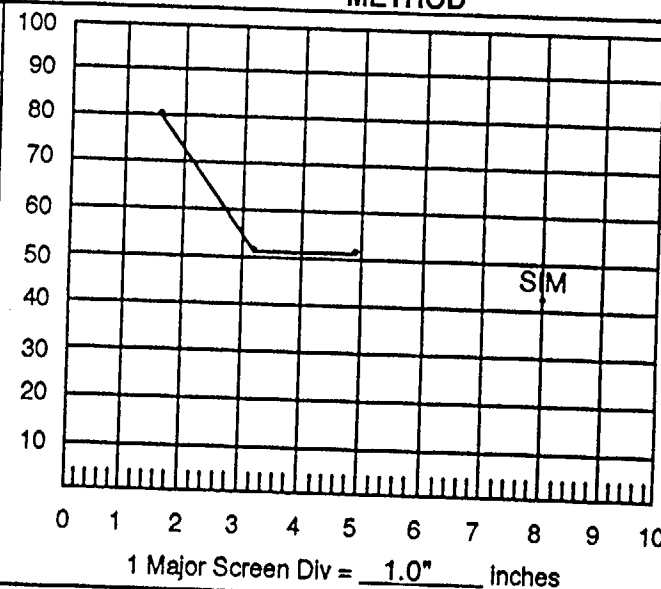
CABLES

| | |
|---------|-------|
| Gain | 44DB |
| Range | 10.0" |
| MTVEL | 128.3 |
| Delay | 14.6 |
| Pulser | HIGH |
| Reject | OFF |
| Freq | 1-5 |
| Zero | 15.86 |
| Display | FULL |
| PRF | HIGH |

| Reflector Type HOLE | Amplitude %FSH | Metal Path inches |
|------------------------|-------------------|----------------------|
| 1 /8 node | 80% | 1.60" |
| 2 /8 node | 52% | 3.20" |
| 3 /8 node | 52% | 4.70" |
| /8 node | | |
| other | | |

Cal Direction: axial ☒ circ. ☒Wave Mode: Long. ☐ shear ☒
surf. ☐

Remarks:



RG58 ☐
RG174 ☒
Length: 6'

Initial Cal Time

0928

Cal Checks

| Time | Initials |
|-------|------------|
| 1259 | <i>WCL</i> |
| 1443 | <i>WCL</i> |
| FINAL | |
| | |
| | |

Jack: T ☐ R ☒

Item No: B03.120.002, B03.120.005, B03.120.006

Reviewer: *C.D. Farley*Level: *II*

Date: 8/31/94

Authorized Inspector: *[Signature]*

Date: 9-28-94

Serial A.O. 98-001
Attachment 3
Page 24 of 39

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1324

Form NDE-UT-2A

Exam Finish: 1356

Revision 4

Station: MCGUIRE

Unit: 1

Component/Weld ID: 1PZR-16R

Date: 8-24-94

Weld Length (in.): 47.1"

Surface Condition: BUFFED

Lo: 9.2.3

Surface Temperature: 90 ° F

Examiner: *W.C. Leeper*

Level: II

Scans:

Pyrometer S/N: MCNDE-27023

Examiner:

Level:

45 ☐ _____ dB 70 ☒ 61 dB

Cal Due: 10/14/94

Procedure: NDE-681

Rev: 0

FC: N/A

45T ☐ _____ dB 70T ☐ _____ dB

Configuration: NOZZLE

Calibration Sheet No:

9401049

9401050

60 ☒ 58 dB

1 Flow 2

PZR to NOZZLE

60T ☐ _____ dB

Scan Surface: OD

Other: _____ dB

Applies to NDE-680 only

Skew Angle: 14°

| IND # | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|-----------|--------|-------|-------|--------------------------|------------|------------|------------|------------|------------|----------|------------|------|-------|
| | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | 60° | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | 70° | | | | NO RECORDABLE INDICATION | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐ no ☒

Sheet _____ of _____

Reviewed By:

Level: II

Date: 8/31/94

Authorized Inspector

Date: 9-28-94

Item No:

B03.120.006

SERIAL No 98-001
ATTACHMENT 3
PAGE 35 of 39

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- U1 x

Revision 1

Component/Weld ID: 1PZR-16R Item No: B03.120.006

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L _____ to L _____ INCHES FROM WO START OF RADIUS to BEYOND
 ANGLE: ☐ 0 ☐ 45 ☒ 60 other 70° FROM 0 DEG to 360 DEG

DUE TO 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: W. C. Leaper

Level: II

Date: 8.24.94

Sheet _____ of _____

Reviewed By: C. D. Jolley

Date: 8/31/94

Authorized Inspector: AD Klein

Date: 9-28-94

SEAL NO 48-001
 ATTACHMENT 3
 PAGE 36 of 39

Limited Exam Data Sheet

Station McGuire Unit 1 I.D. # 1PZR-16R
By W.C. Leeper Date 8-24-94 Item # 1303.120.006
Checked By C.D. Jolley Date 8/31/94 Page Of

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area N/A x (Number of Scans) = N/A (% Factor)

Vessels:

Area Loss : Zone #1 N/A

Zone #2 N/A

Zone #3 N/A

Total Zone Loss .65 / (% Factor) 1.25 x 100 = 37 % of Loss

Lump Sum Loss From Other Limitations + 0 %

Total Loss 37 %

100% - (Total Loss) 37% = 63 % of Coverage *See Attached Sheet*
(Additional % of Partial Coverage)

Qualifies for Request for Relief ☒ Yes ☐ No *1082*

Piping:

Axial Scan (Loss) / (% Factor) x 100 = % of Loss

Circumferential Scan Over Root Area ☐ Yes ☐ No % of Loss

Axial Loss + Circ. Loss = / 2 = % Loss

Additional Losses (Due to hangers, restraints, etc.) + % Loss

Explain: Total % Loss

100% - (Total Loss) = % of Coverage

Qualifies for Request for Relief ☐ Yes ☐ No

Disposition:

By: Date:

INNER RADIUS

TOTAL AREA OF INTEREST

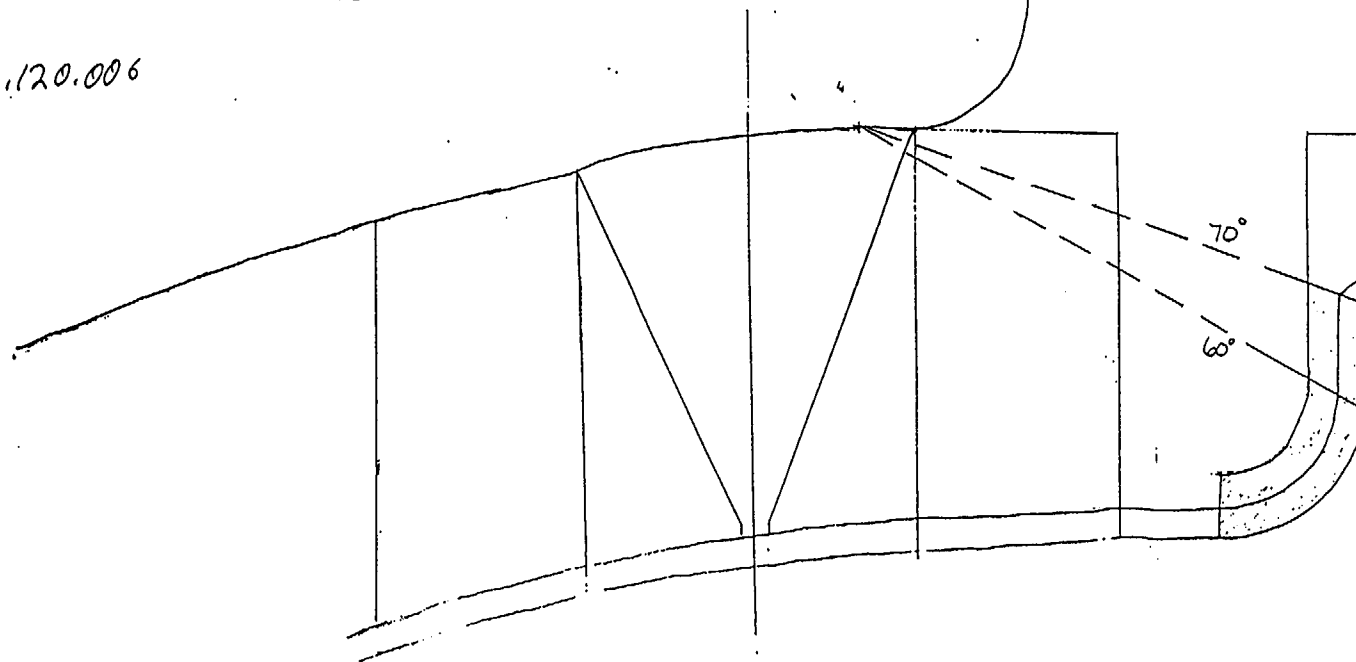
$$3.5" \times 5" = 1.75 \text{ IN}^2$$

AREA OF COVERAGE USING
A COMBINATION OF A 60°
E 70° BEAM ANGLES

$$2.2" \times .5" = 1.1 \text{ IN}^2$$

$$\% \text{ COVERAGE} = \frac{1.1 \text{ IN}^2}{1.75 \text{ IN}^2} \times 100 = 63\%$$

B03.120.006



| DRAWING DIM. | | | | AS BUILT DIM. | | | | |
|--------------|----------|------|------------|---------------|----------|------|--------|----------|
| TITLE | SEAM NO. | "A" | "B" | "C" DIA. | SEAM NO. | "A" | "B" | "C" DIA. |
| GIRTH WELD | 1 | | 15.751.58 | | 1 | | 15.75 | |
| | 2 | | 152.811.00 | | 2 | | 152.75 | |
| | 3 | | 152.811.00 | | 3 | | 152.75 | |
| | 4 | | 152.811.00 | | 4 | | 152.75 | |
| | 5 | | 152.811.00 | | 5 | | 152.75 | |
| LONG. WELD | 1 | 40" | | | 1 | 160" | | |
| | 2 | 115" | | | 2 | 115" | | |
| | 3 | 115" | | | 3 | 115" | | |
| | 4 | 115" | | | 4 | 115" | | |
| | 5 | 115" | | | 5 | 115" | | |
| SARGE WELD | 1 | | | | 10 | | | 24.50 |
| | 2 | | | | 11 | | | 22.50 |
| | 3 | | | | 12 | | | 22.75 |
| | 4 | | | | 13 | | | 15.00 |
| | 5 | | | | 14 | | | 15.00 |
| SARGE WELD | 1 | | | | 15 | | | 15.00 |
| | 2 | | | | 16 | | | 15.00 |
| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
| | 2 | | | | | | | |
| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
| | 2 | | | | | | | |
| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
| | 2 | | | | | | | |
| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
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| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
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| | 4 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
| | 2 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
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| SARGE WELD | 1 | | | | | | | |
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| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
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| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
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| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
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| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
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| | 3 | | | | | | | |
| | 4 | | | | | | | |
| | 5 | | | | | | | |
| SARGE WELD | 1 | | | | | | | |
| | 2 | | | | | | | |
| | 3 | | | | | | | |
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NOTES

- ALL AS BUILT DIMENSIONS EXCEEDING
DRAWING TOLERANCES ARE TO BE CIRCLED.
THE RESOLUTION OF THE CIRCLED DIM'S,
ARE REPORTED ON E.A.N. NO. 00261

DWG. NO. 5474 1201, 01-017: 0015

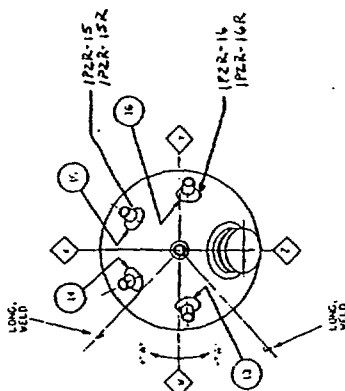
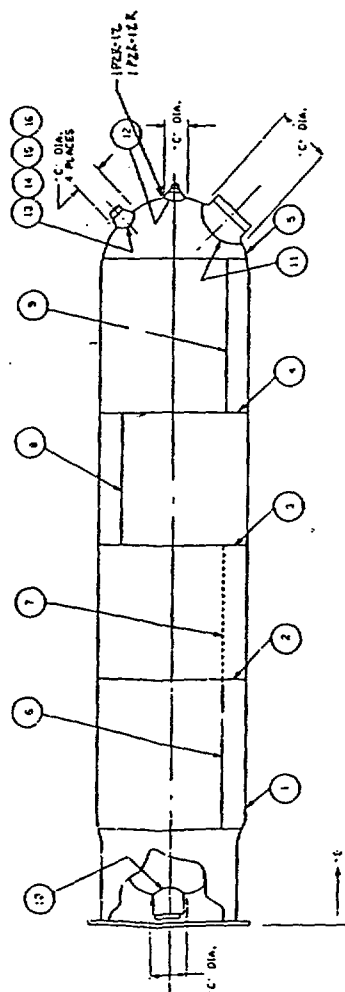
James P. O'Neil, C.J. 10/14/2011

WIRE MULTICAST STATION

STATUS: 05 MAR 1964

IDENTIFICATION LETTER NO.

INCA. 61R. 140.



RECEIVED
MAY 25 1977
FEDERAL BUREAU OF INVESTIGATION
U.S. DEPARTMENT OF JUSTICE

APPROVED
DUKE POWER CO.
DATE APR 10 1991
BY: [illegible]
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OA CONDITION !
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S.O. NO. DAPT-1471

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Tampa Division Tampa Fla.

Page 1 of 1

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1. **Introduction**

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DUKE POWER COMPANY

FORM NDE-UT-1E

ULTRASONIC CALIBRATION SHEET FOR USK-7D INSTRUMENTS

REVISION 2

| | | | |
|-------------------------------------|------------------|-------------------------------------|--|
| Station: <u>McGURE</u> | Unit: <u>1</u> | Date: <u>9-19-94</u> | Sheet Number: <u>9401133</u> |
| Procedure: <u>NDE-611</u> | Rev: <u>0</u> | F/C: <u>NA</u> | Couplant: <u>ULTRA-GEL</u> Batch Number: <u>093001</u> |
| Examiner: <u>David K. Zimmerman</u> | Level: <u>IT</u> | Calibration Block ID: <u>50214</u> | Pyrometer S/N: <u>MCNDE27024</u> |
| Examiner: <u>Ray Moss</u> | Level: <u>II</u> | Calibration Block Temp: <u>81°F</u> | Cal. due: <u>941014</u> |

REFERENCE BLOCK

SIMULATOR BLOCK

| | | |
|----------------------|----------------------|--|
| ID: <u>G10-A</u> | ID: <u>91-5861</u> | Reflector Type: <u>RADIUS</u> |
| Type: <u>MOD-11W</u> | Material: <u>S/S</u> | Gain: <u>49.5</u> Signal Ampl: <u>80⁷⁰</u> Metal Path: <u>1.0</u> |

INSTRUMENT

TRANSDUCER

| | |
|----------------------------------|---|
| Manufacturer: <u>Krautkramer</u> | Type: Single <input type="checkbox"/> Dual <input checked="" type="checkbox"/> Size: <u>2(1.0 x 1.0)</u> Freq: <u>1.0</u> Mhz Wedge <u>INTEGRAL</u> |
| Serial No: <u>32810-618</u> | Manufacturer: <u>HARLSONICS</u> Ser no: <u>G8004</u> Meas. <u>Δ 45L</u> ° |

| INSTRUMENT SETTINGS | | CALIBRATION | | | METHOD | | CABLES | | | | | | | | | | | | | |
|---|--|---|----------------|-------------------|--|--|--|--|------|----------|------|-----|------|-----|--|--|--|--|--|--|
| Gain | <u>56.0</u> | Reflector Type | Amplitude %FSH | Metal Path inches | <p>1 Major Screen Div. = <u>0.50</u> inches</p> | | RG58 <input type="checkbox"/> RG174 <input checked="" type="checkbox"/> Length: <u>12 ft.</u> Initial Cal Time <u>1405</u> Cal Checks <table border="1"> <thead> <tr> <th>Time</th> <th>Initials</th> </tr> </thead> <tbody> <tr> <td>1500</td> <td>DKZ</td> </tr> <tr> <td>1623</td> <td>DKZ</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> | | Time | Initials | 1500 | DKZ | 1623 | DKZ | | | | | | |
| Time | Initials | | | | | | | | | | | | | | | | | | | |
| 1500 | DKZ | | | | | | | | | | | | | | | | | | | |
| 1623 | DKZ | | | | | | | | | | | | | | | | | | | |
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| Range | <u>5.0</u> | <u>1/8 node</u> | <u>40</u> | <u>0.9</u> | | | | | | | | | | | | | | | | |
| MTVEL | <u>220.2</u> | <u>2/8 node</u> | <u>80</u> | <u>1.85</u> | | | | | | | | | | | | | | | | |
| Delay | <u>8.5</u> | <u>3/8 node</u> | <u>57</u> | <u>2.55</u> | | | | | | | | | | | | | | | | |
| Pulser | <u>DUAL</u> | <u>1/8 node</u> | | | | | | | | | | | | | | | | | | |
| Reject | <u>OFF</u> | other <u>NOTCH</u> | <u>33</u> | <u>3.5</u> | | | | | | | | | | | | | | | | |
| Freq | <u>1-5MHZ</u> | Cal Direction: axial <input checked="" type="checkbox"/> circ. <input type="checkbox"/> | | | Item No: <u>B05.070.007, B05.070.008, B05.130.014, & B05.130.015</u> | | | | | | | | | | | | | | | |
| Zero | <u>9.19</u> | Wave Mode: Long. <input checked="" type="checkbox"/> shear <input type="checkbox"/> surf. <input type="checkbox"/> | | | | | | | | | | | | | | | | | | |
| Display | <u>FULL</u> | Remarks: <u>NOTCH EXCEEDS DAC</u> | | | | | | | | | | | | | | | | | | |
| PRF | <u>HIGH</u> | <u>2 REF.</u> | | | | | | | | | | | | | | | | | | |
| Jack: T <input checked="" type="checkbox"/> R <input checked="" type="checkbox"/> | Reviewer: <u>James J. McCallister</u> Level: <u>III</u> Date: <u>9-27-94</u> Authorized Inspector: <u>Ady Klein</u> Date: <u>9-30-94</u> | | | | | | | | | | | | | | | | | | | |

 SERIAL NO 98 601
 ATTACHMENT 4
 PAGE 1 of 7

| | | | | | | | | | | | | | |
|--|--|--|--|--|--|---------------------------------------|--|---|--|------------------------------------|--|-------------------------|--|
| DUKE POWER COMPANY | | | | | | | | | | Exam Start: 1509 | | Form NDE-UT-2A | |
| ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS | | | | | | | | | | Exam Finish: 1551 | | Revision 4 | |
| Station: <u>M SCURIE</u> | | | | Unit: <u>1</u> | | Component/Weld ID: <u>INC 11F-4-2</u> | | | | Date: <u>9-19-94</u> | | | |
| Weld Length (in.): <u>97.4"</u> | | | | Surface Condition: <u>As Ground</u> | | | | BEW LO: NO.1 REF | | Surface Temperature: <u>84 ° F</u> | | | |
| Examiner: <u>Daniel K. Zimmerman</u> Level: <u>II</u> | | | | Scans: 45 <input checked="" type="checkbox"/> <u>62</u> dB 70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> <u>59.5</u> dB 70T <input type="checkbox"/> _____ dB 60 <input type="checkbox"/> _____ dB 60T <input type="checkbox"/> _____ dB Other: _____ dB | | | | Pyrometer S/N: <u>MCNDE27024</u> | | | | | |
| Examiner: <u>Gary M...</u> Level: <u>D</u> | | | | | | | | Cal Due: <u>941014</u> | | | | | |
| Procedure: <u>NDE 611</u> Rev: <u>0</u> FC: <u>NA</u> | | | | | | | | Configuration: <u>CIRC WELD</u> <u>S1</u> Flow <u>S2</u> <u>SAFE END</u> to <u>PIPE</u> | | | | | |
| Calibration Sheet No: <u>9401133</u> <u>9401134</u> | | | | | | | | Scan Surface: <u>OD</u> | | | | Applies to NDE-680 only | |
| | | | | | | | | Skew Angle: <u>NA</u> | | | | | |

| IND # | <input checked="" type="checkbox"/> | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|-------------------------------------|--------------|-----------|----------|----------|----------------------------------|---------------|---------------|---------------|---------------|---------------|-------------|---------------|------|-------|
| | | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | |
| | | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | | | | | | <u>NO RECORDABLE INDICATIONS</u> | | | | | | | | | |
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| Remarks: | | |
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | | Sheet _____ of _____ |
| Reviewed By: <u>James J. McFadden</u> | Level: <u>III</u> Date: <u>9-27-94</u> | Authorized Inspector: <u>[Signature]</u> Date: <u>9-30-94</u> Item No: <u>B05.130.014</u> |

| DUKE POWER COMPANY | | | | | | | | | | Exam Start: 1509 | | Form NDE-UT-2A | |
|--|--|--|--|-------------------------------------|--|---|--|----------------------|--|--|--|----------------|--|
| ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS | | | | | | | | | | Exam Finish: 1551 | | Revision 4 | |
| Station: <u>115CTURE</u> | | | | Unit: <u>1</u> | | Component/Weld ID: <u>15CTD-MLET-3E</u> | | | | Date: <u>9-19-94</u> | | | |
| Weld Length (in.): <u>97.4"</u> | | | | Surface Condition: <u>As Ground</u> | | | | B&W Lo: No. 1 REF | | Surface Temperature: <u>84° F</u> | | | |
| Examiner: <u>David K. Zimmerman</u> | | | | Level: <u>II</u> | | Scans: 45 <input checked="" type="checkbox"/> <u>62</u> dB 70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> <u>59.5</u> dB 70T <input type="checkbox"/> _____ dB 60 <input type="checkbox"/> _____ dB 60T <input type="checkbox"/> _____ dB Other: _____ dB | | | | Pyrometer S/N: <u>MCNDE27024</u> | | | |
| Examiner: <u>Sam Moss</u> | | | | Level: <u>II</u> | | | | | | Cal Due: <u>941014</u> | | | |
| Procedure: <u>NDE-611</u> | | | | Rev: <u>0</u> | | | | | | FC: <u>NA</u> | | | |
| Calibration Sheet No: <u>9401133</u> <u>9401134</u> | | | | | | | | | | Configuration: <u>CIRC. WELD</u> <u>SI</u> Flow <u>SZ</u> <u>NOZZLE</u> to <u>SAFE END</u> | | | |
| | | | | | | Scan Surface: <u>OD</u> | | | | Applies to NDE-680 only | | | |
| | | | | | | Skew Angle: <u>NA</u> | | | | | | | |

| IND # | <input checked="" type="checkbox"/> | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|-------------------------------------|-----------|--------|-------|-------|----------------------------------|-------------|-------------|-------------|-------------|-------------|----------|------------|------|-------|
| | | | | | | 20% dac HMA | 20% dac HMA | 20% dac HMA | 20% dac HMA | 20% dac HMA | 20% dac HMA | | | | |
| | | | | | | 50% dac | 50% dac | 50% dac | 50% dac | 50% dac | 50% dac | | | | |
| | | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | | | | | | <u>NO RECORDABLE INDICATIONS</u> | | | | | | | | | |
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| Remarks: | | |
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | | Sheet _____ of _____ |
| Reviewed By: <u>James J. McQuillen</u> | Level: <u>III</u> | Date: <u>9-27-94</u> |
| Authorized Inspector: <u>[Signature]</u> | | Date: <u>9-30-94</u> |
| | | Item No: <u>B05.070.007</u> |

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: INCLIF - 4 - 2 / 1850-INLET SE Item No: ^{BOS. 070.0077}1305.130.014

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☐ 2 ☒ cw ☒ ccw
 FROM L _____ to L _____ INCHES FROM WO 0.075 to BEYOND
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other _____ 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 4 to BEYOND
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other _____ 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

Sketch(s) attached

☒ yes ☐ no

Prepared By: David K. Zimmerman

Level: II

Date: 9-19-94

Sheet 2 of 3

Reviewed By: James J. McGillicuddy Date: 9-27-94

Authorized Inspector: [Signature]

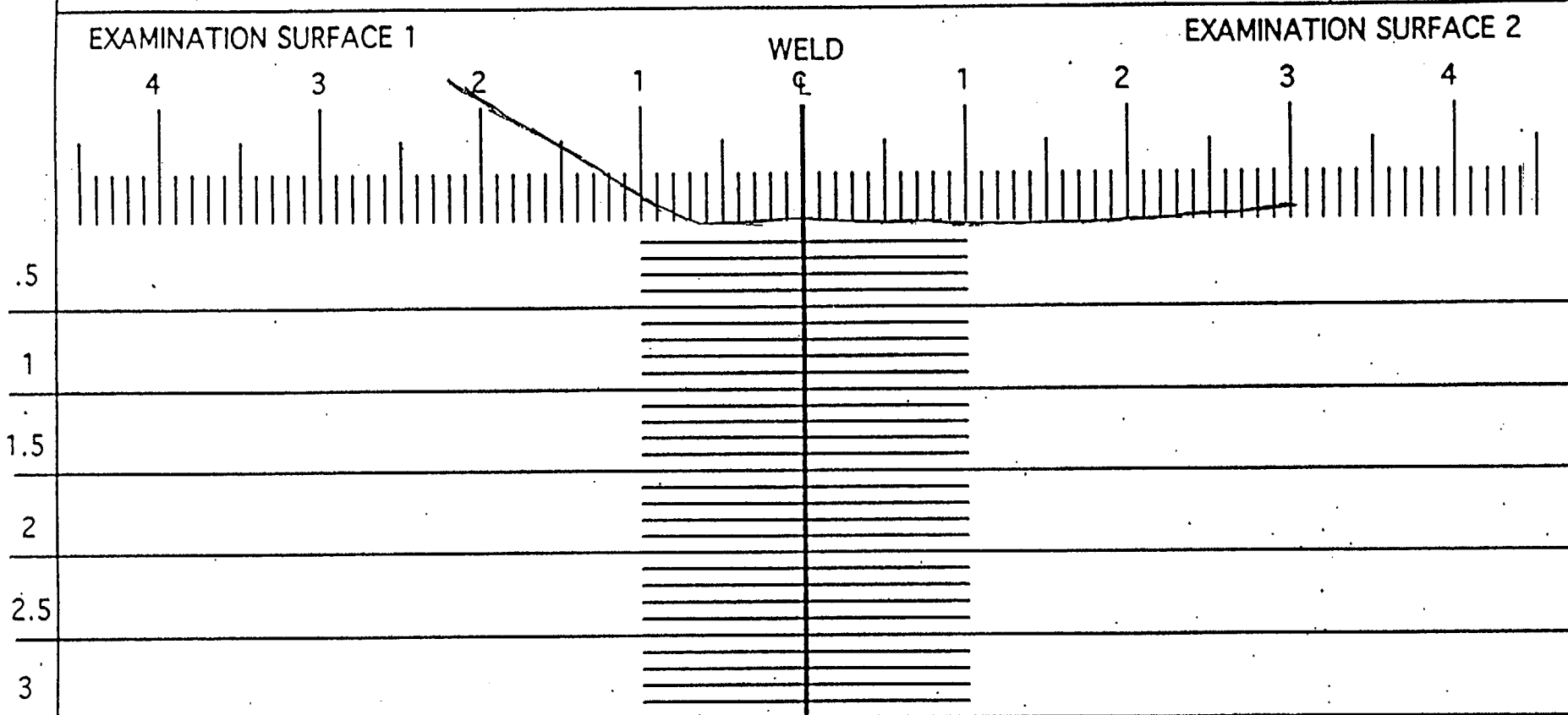
Date: 9-10-94

ATTACHMENT 4
PAGE 4 of 7

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



Component ID/Weld No. ICNIE-4.2 / ISCED-INLET-SE

Remarks:

Item No: B05.130.014 / B05.070.007

Examiner: Daniel K. Zimig

Level: II

Date: 9-19-94

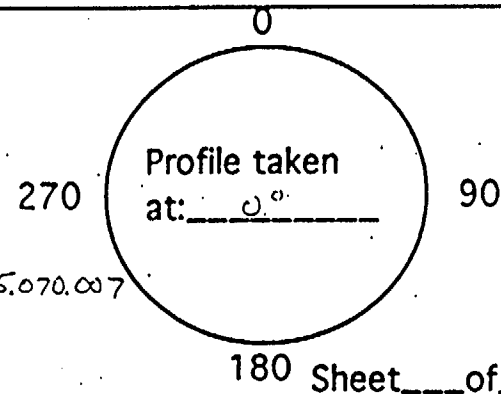
Reviewed By: James J. McQuillan

Level: III

Date: 9-27-94

Authorized Inspector: [Signature]

Date: 9-30-94



180 Sheet ___ of ___

Limited Exam Data Sheet

Station M^cGUIREUnit 1

I.D. #

ISGD - INLET - SE /By David K. Zimmerman

Date

9-19-94

Item #

INCLIF-4-2B05.070.007/
B05.130.014Checked By James J. McQuillen

Date

9-27-94Page 1 Of 3DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED
(in percentage) NA

Total Cross Sectional Area _____ x (Number of Scans) _____ = _____ (% Factor)

Vessels:

Area Loss : Zone #1 _____

Zone #2 _____

Zone #3 _____

Total Zone Loss _____ / (% Factor) _____ x 100 = _____ % of Loss

Lump Sum Loss From Other Limitations + _____ %

Total Loss _____ %

100% - (Total Loss) _____ = _____ % of Coverage

(Additional _____ % of Partial Coverage)

Qualifies for Request for Relief ☐ Yes ☐ No

Piping:

Axial Scan _____ (Loss) _____ / _____ (% Factor) x 100 = X % of LossCircumferential Scan Over Root Area ☐ Yes ☐ No X % of Loss

Axial Loss _____ + Circ. Loss _____ = _____ / 2 = _____ % Loss

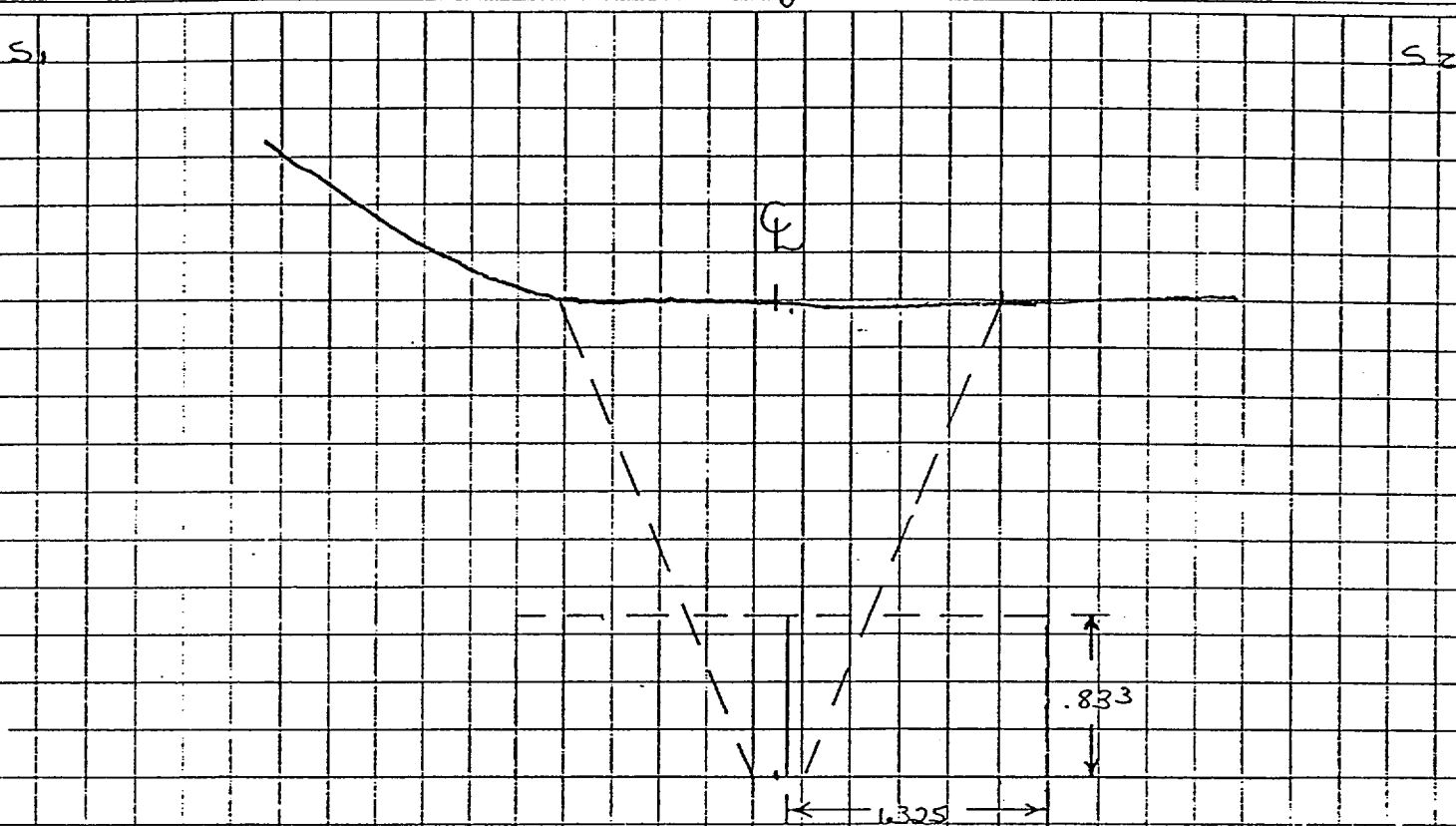
Additional Losses (Due to hangers, restraints, etc.) + _____ % Loss

Explain: * SEE ATTACHED CALCULATIONS 51.4 Total % Loss100% - (Total Loss) 51.4 = 48.6 % of CoverageQualifies for Request for Relief ☒ Yes ☐ NoDisposition: Relief RequestBy: James J. McQuillen

Date:

9-27-94

Station _____ Unit _____ Rev. _____ File No. _____ Sheet 3 of 3
 Subject ISLD-WLET-5E1 INCLIF-4-2 ITEM NO. B05.130.014 / B05.070.007
 By David K. Zimmerman Date 9-19-94
 Prob No. _____ Checked By James J. McFadden Date 9-27-94



$$\text{CIRC. SCAN COVERAGE} = 1.325 \text{ in} \times 0.833 \text{ in} = 1.1 \text{ in}^2$$

$$\text{AREA OF INTEREST} = 2.80 \text{ in} \times 0.833 \text{ in} = 2.33 \text{ in}^2$$

$$\text{AREA OF INTEREST @ } 2.33 \text{ in}^2 \times 4 \text{ SCANS} = 9.32 \text{ in}^2$$

$$\text{AREA OF COVERAGE} = 1.1 \text{ in}^2 + 1.1 \text{ in}^2 + 2.33 \text{ in}^2 + 0 \text{ in}^2 = 4.53 \text{ in}^2$$

$$\text{PERCENT OF COVERAGE} = \frac{4.53 \text{ in}^2}{9.32 \text{ in}^2} = .486 = 48.6\%$$

DUKE POWER COMPANY

FORM NDE-UT-1E

ULTRASONIC CALIBRATION SHEET FOR USK-7D INSTRUMENTS

REVISION 2

| | | | |
|-------------------------------------|------------------|-------------------------------------|--|
| Station: <u>M^S GUIRE</u> | Unit: <u>1</u> | Date: <u>9-14-94</u> | Sheet Number: <u>9401134</u> |
| Procedure: <u>NDE-611</u> | Rev: <u>0</u> | FIC: <u>NA</u> | Couplant: <u>ULTRA-TEC</u> Batch Number: <u>093001</u> |
| Examiner: <u>David K. Zimmerman</u> | Level: <u>II</u> | Calibration Block ID: <u>50214</u> | Pyrometer S/N: <u>MLNDE37024</u> |
| Examiner: <u>Sam M</u> | Level: <u>II</u> | Calibration Block Temp: <u>81°F</u> | Cal. due: <u>941014</u> |

| | |
|--|--|
| REFERENCE BLOCK | SIMULATOR BLOCK |
| ID: <u>610-C</u> | ID: <u>91-5861</u> Reflector Type: <u>RADUIS</u> |
| Type: <u>MOD IIIA</u> Material: <u>S/S</u> | Gain: <u>49.5</u> Signal Ampl: <u>80⁷⁰</u> Metal Path: <u>1.0</u> |

| | |
|----------------------------------|---|
| INSTRUMENT | TRANSDUCER |
| Manufacturer: <u>Krautkramer</u> | Type: Single <input type="checkbox"/> Dual <input checked="" type="checkbox"/> Size: <u>2(1.0 x 1.0)</u> Freq: <u>1.0</u> Mhz Wedge <u>INTEGRAL</u> |
| Serial No: <u>32810-618</u> | Manufacturer: <u>HARISONKS</u> Ser no: <u>H7131</u> Meas. <u>Δ 45L°</u> |

| | | | |
|---|---|----------|---|
| INSTRUMENT SETTINGS | CALIBRATION | METHOD | CABLES |
| Gain: <u>53.5</u> | Reflector Type | | RG58 <input type="checkbox"/> |
| Range: <u>5.0</u> | Amplitude %FSH | | RG174 <input checked="" type="checkbox"/> |
| MTVEL: <u>220.2</u> | Metal Path inches | | Length: <u>12 ft.</u> |
| Delay: <u>9.0</u> | | | Initial Cal Time: <u>1411</u> |
| Pulser: <u>DUAL</u> | | | Cal Checks |
| Reject: <u>OFF</u> | | | Time Initials |
| Freq: <u>1-5 MHz</u> | Cal Direction: axial <input type="checkbox"/> circ. <input checked="" type="checkbox"/> | 1531 DKZ | |
| Zero: <u>8.09</u> | Wave Mode: Long. <input checked="" type="checkbox"/> shear <input type="checkbox"/> | 1621 DKZ | |
| Display: <u>FULL</u> | surf. <input type="checkbox"/> | | |
| PRF: <u>HIGH</u> | Remarks: <u>NOTCH EQUALS DAC</u> | | |
| Jack: T <input checked="" type="checkbox"/> R <input checked="" type="checkbox"/> | Item No: <u>B05.070.007, B05.070.008, B05.130.014, & B05.130.015</u> | | |

| | | | |
|----------------------------------|-------------------|----------------------|--|
| Reviewer: <u>James J. McCall</u> | Level: <u>III</u> | Date: <u>9-27-94</u> | Authorized Inspector: <u>[Signature]</u> |
|----------------------------------|-------------------|----------------------|--|

 SERIAL NO. 98-001
 ATTACHMENT 5
 PAGE 1 of 7

| DUKE POWER COMPANY | | | | | | | | | | Exam Start: 1520. | | Form NDE-UT-2A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------------------------------|--------------|-----------|-------------------------------------|----------|--|---------------|--|---------------|---|---------------|----------------------|---------------|-----------------------------|-------------------------------------|--------------|-----------|----------|----------|----|----|----|-----|----|-----|-------------|---------------|------|-------|--|--|--|--|--|--|---------------|---------------|---------------|---------------|---------------|---------------|--|--|--|--|--|--|--|--|--|--|--------|--------|--------|--------|--------|--------|--|--|--|--|--|--|--|--|--|--|----------|----------|----------|----------|----------|----------|--|--|--|--|--|--|--|--|--|--|----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS | | | | | | | | | | Exam Finish: 1540 | | Revision 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station: <u>M⁵ CRUPE</u> | | | | Unit: <u>1</u> | | Component/Weld ID: <u>1SGD-OUTLET-SE</u> | | | | Date: <u>9-19-94</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Weld Length (in.): <u>97.4"</u> | | | | Surface Condition: <u>As Ground</u> | | | | BEW LO: NO.1 REF. | | Surface Temperature: <u>84 ° F</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Examiner: <u>Daniel K. Zimmerman</u> | | | | Level: <u>II</u> | | Scans: 45 <input checked="" type="checkbox"/> <u>62</u> dB 70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> <u>59.5</u> dB 70T <input type="checkbox"/> _____ dB 60 <input type="checkbox"/> _____ dB 60T <input type="checkbox"/> _____ dB Other: _____ dB | | | | Pyrometer S/N: <u>MCNDE27024</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Examiner: <u>Harry Moss</u> | | | | Level: <u>II</u> | | | | | | Cal Due: <u>941014</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Procedure: <u>NDE-611</u> Rev: <u>0</u> | | | | FC: <u>NA</u> | | | | | | Configuration: <u>CIRC. WELD</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibration Sheet No: <u>9401133</u> <u>9401134</u> | | | | | | | | | | <u>S1</u> Flow <u>S2</u> <u>SAFE END</u> to <u>NOZZLE</u> Scan Surface: <u>OD</u> Applies to NDE-680 only Skew Angle: <u>NA</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>IND #</th> <th><input checked="" type="checkbox"/></th> <th>Max % Ref</th> <th>Mp Max</th> <th>W Max</th> <th>L Max</th> <th>L1</th> <th>L2</th> <th>W1</th> <th>Mp1</th> <th>W2</th> <th>Mp2</th> <th>Beam Dir</th> <th>Exam surf.</th> <th>Scan</th> <th>Damps</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>20%dac HMA</td> <td>20%dac HMA</td> <td>20%dac HMA</td> <td>20%dac HMA</td> <td>20%dac HMA</td> <td>20%dac HMA</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>50%dac</td> <td>50%dac</td> <td>50%dac</td> <td>50%dac</td> <td>50%dac</td> <td>50%dac</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>100% dac</td> <td>100% dac</td> <td>100% dac</td> <td>100% dac</td> <td>100% dac</td> <td>100% dac</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="10"><u>NO RECORDABLE INDICATIONS</u></td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> | | | | | | | | | | | | | | IND # | <input checked="" type="checkbox"/> | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps | | | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | | | | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | | | | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | | | | | | | | <u>NO RECORDABLE INDICATIONS</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IND # | <input checked="" type="checkbox"/> | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | <u>NO RECORDABLE INDICATIONS</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | | | | | | | | | | | | Sheet _____ of _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reviewed By: <u>James J. McCallum</u> | | | | Level: <u>III</u> | | Date: <u>9-27-94</u> | | Authorized Inspector: <u>[Signature]</u> | | | | Date: <u>9-30-94</u> | | Item No: <u>B05.070.008</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|--|--|--|--|--|--|--------------------------------------|--|---|--|------------------------------------|--|----------------|--|
| DUKE POWER COMPANY | | | | | | | | | | Exam Start: 1520 | | Form NDE-UT-2A | |
| ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS | | | | | | | | | | Exam Finish: 1540 | | Revision 4 | |
| Station: <u>NA & TUIRE</u> | | | | Unit: <u>1</u> | | Component/Weld ID: <u>INCLIF-4-3</u> | | | | Date: <u>9-19-94</u> | | | |
| Weld Length (in.): <u>97.4"</u> | | | | Surface Condition: <u>As (GROUND)</u> | | | | B&W LO: <u>NO.1 REF</u> | | Surface Temperature: <u>84 ° F</u> | | | |
| Examiner: <u>David K Zimmerman</u> Level: <u>II</u> | | | | Scans: 45 <input checked="" type="checkbox"/> <u>62</u> dB 70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> <u>59.5</u> dB 70T <input type="checkbox"/> _____ dB 60 <input type="checkbox"/> _____ dB 60T <input type="checkbox"/> _____ dB Other: _____ dB | | | | Pyrometer S/N: <u>MCNDE27024</u> | | | | | |
| Examiner: <u>Sam J. Moore</u> Level: <u>II</u> | | | | | | | | Cal Due: <u>941014</u> | | | | | |
| Procedure: <u>NDE 611</u> Rev: <u>0</u> FC: <u>NA</u> | | | | | | | | Configuration: <u>CIRC. WELD</u> <u>S1</u> Flow <u>S2</u> <u>NO PIPE</u> to <u>SAFE END</u> | | | | | |
| Calibration Sheet No: <u>9401133</u> <u>9401134</u> | | | | | | | | Scan Surface: <u>OD</u> Applies to NDE-680 only | | | | | |
| Skew Angle: <u>NA</u> | | | | | | | | | | | | | |

| IND # | | Max % Ref | Mp Max | W Max | L Max | L1 | L2 | W1 | Mp1 | W2 | Mp2 | Beam Dir | Exam surf. | Scan | Damps |
|-------|--|----------------------------------|-----------|----------|----------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|---------------|------|-------|
| | | | | | | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | 20%dac HMA | | | | |
| | | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | 100% dac | | | | |
| | | <u>NO RECORDABLE INDICATIONS</u> | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Remarks:

| | | | | | | | | | | | | | | |
|---|--|--|-------------------|--|----------------------|--|--|--|--|----------------------|----------------------|--|-----------------------------|--|
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | | | | | | | | | | Sheet _____ of _____ | | | | |
| Reviewed By: <u>James J. McQuillen</u> | | | Level: <u>III</u> | | Date: <u>9-27-94</u> | | | Authorized Inspector: <u>[Signature]</u> | | | Date: <u>9-30-94</u> | | Item No: <u>B05.130.015</u> | |

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

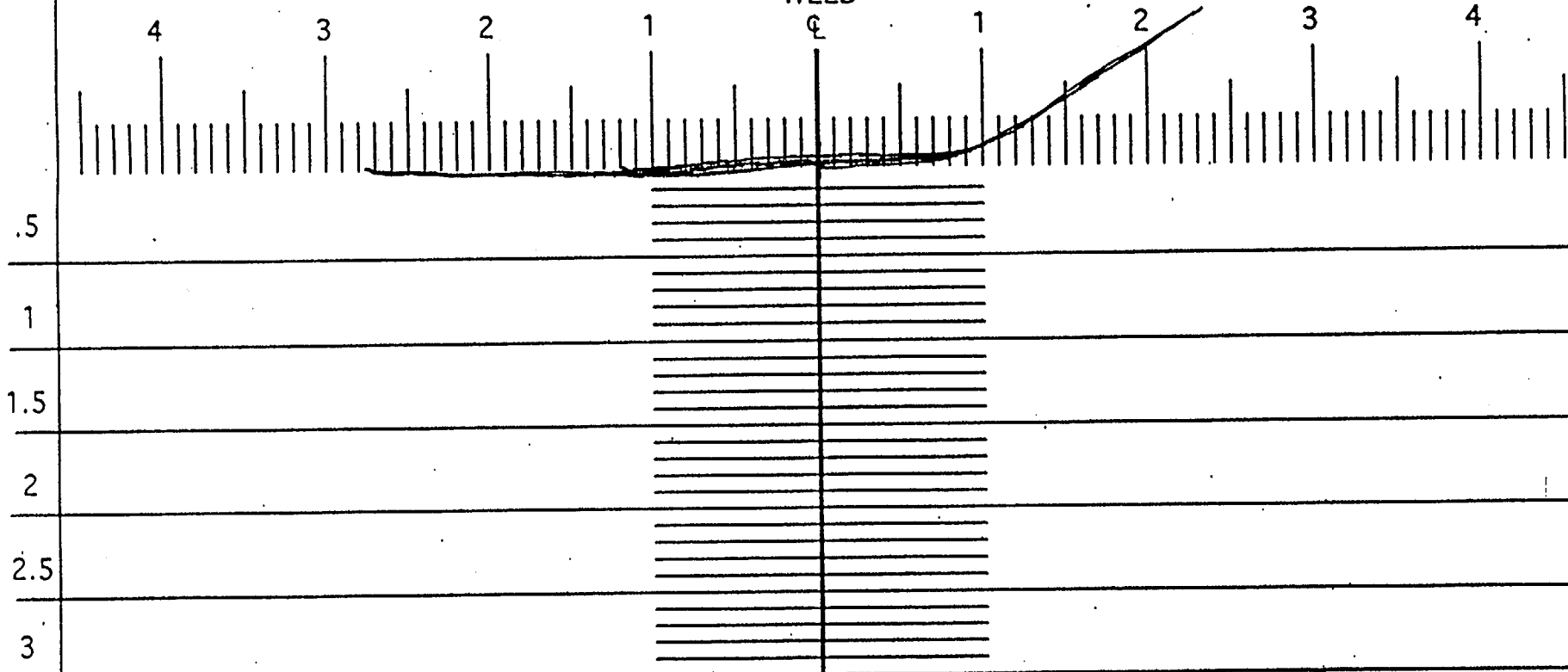
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. INCIF-4-3

Remarks:

Item No: B05.130.015

Examiner: Stanley Moss

Level: II

Date: 9-19-94

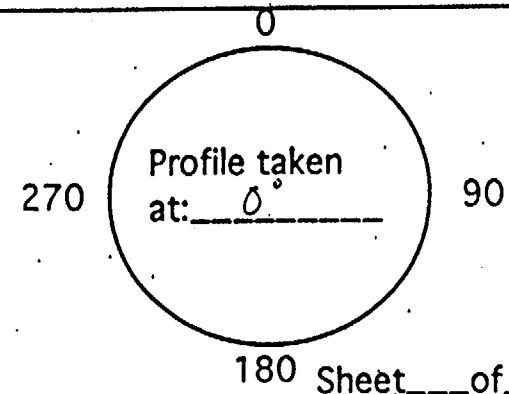
Reviewed By: Samuel J. McQuillan

Level: III

Date: 9-27-94

Authorized Inspector: John J. Levin

Date: 9-30-94



180 Sheet ___ of ___

Limited Exam Data Sheet

Station M² CURIE Unit 1 I.D. # 154D-OUTLET-SE1
By David K. Zimmerman Date 9-19-94 Item # INCIF-4-3
Checked By James J. McQuillen Date 9-27-94 Page 2 Of 3
BOS.070.0087
BOS.130.015

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED
(in percentage) N/A

Total Cross Sectional Area _____ x (Number of Scans) _____ = _____ (% Factor)

Vessels:

Area Loss : Zone #1 _____

Zone #2 _____

Zone #3 _____

Total Zone Loss _____ / (% Factor) N/A x 100 = _____ % of Loss

Lump Sum Loss From Other Limitations + _____ %

Total Loss _____ %

100% - (Total Loss) _____ = _____ % of Coverage

(Additional _____ % of Partial Coverage)

Qualifies for Request for Relief ☐ Yes ☐ No

Piping:

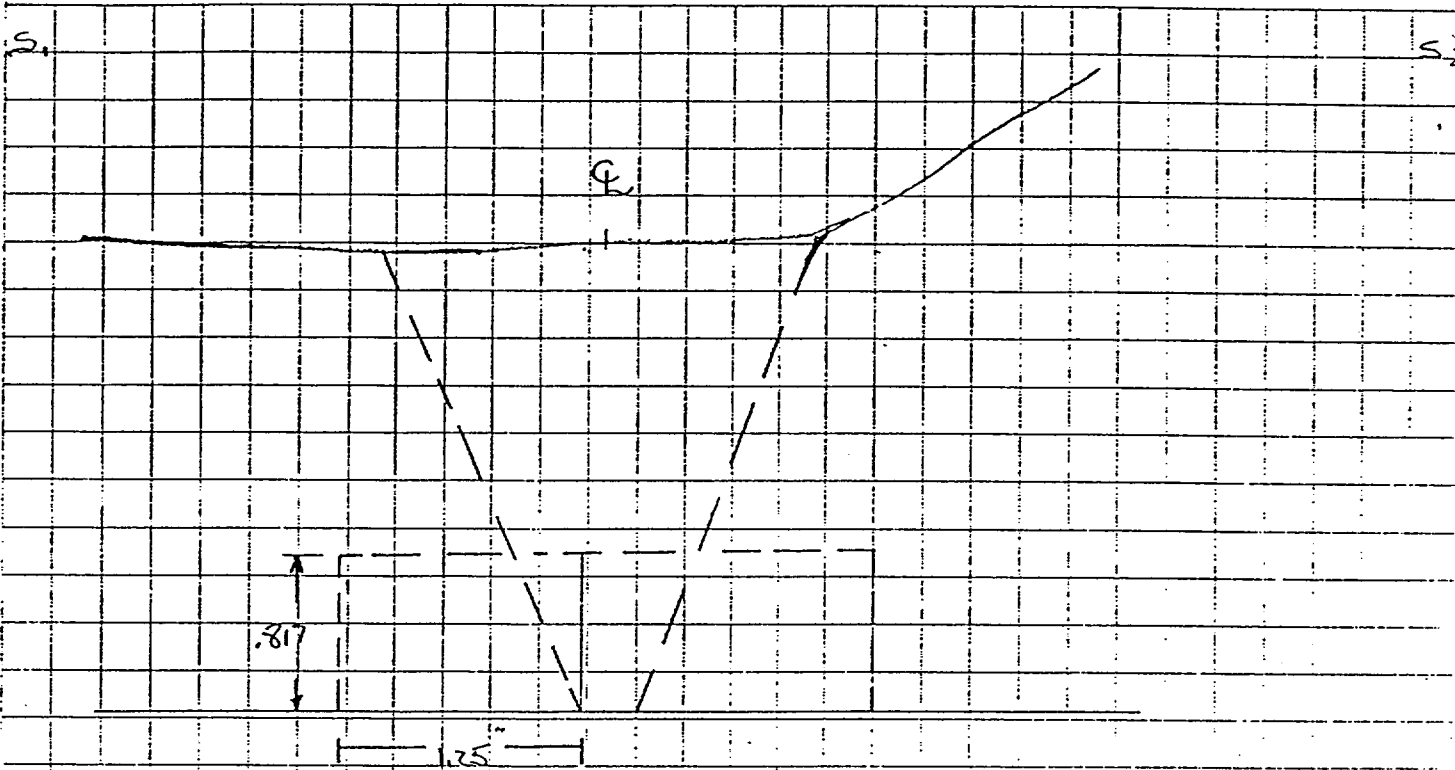
Axial Scan _____ (Loss) _____ / _____ (% Factor) x 100 = X % of LossCircumferential Scan Over Root Area ☐ Yes ☐ No X % of Loss

Axial Loss _____ + Circ. Loss _____ = _____ / 2 = _____ % Loss

Additional Losses (Due to hangers, restraints, etc.) + _____ % Loss

Explain: X SEE ATTACHED CALCULATIONS 52.7 Total % Loss100% - (Total Loss) 52.7 = 47.3 % of CoverageQualifies for Request for Relief ☒ Yes ☐ NoDisposition: Relief RequestBy: James J. McQuillenDate: 9-27-94

Station 1SGD-OUTLET/EET Unit Rev. File No. Sheet 3 of 3
 Subject INLET-4-3 ITEM NO. B05.130.015 / B05.070.008
 By David K. Zimmerman Date 9-19-94
 Prob No. Checked By James J. McPherson Date 9-27-94



$$\text{CIRC SCAN COVERAGE} = 1.25 \text{ in} \times 0.817 \text{ in} = 1.02 \text{ in}^2$$

$$\text{AREA OF INTEREST} = 2.8 \text{ in} \times 0.817 \text{ in} = 2.29 \text{ in}^2$$

$$\text{AREA OF INTEREST @ } 2.29 \text{ in}^2 \times 4 \text{ SCANS} = 9.15 \text{ in}^2$$

$$\text{AREA OF COVERAGE} = 2.29 \text{ in}^2 + 1.02 \text{ in}^2 + 1.02 \text{ in}^2 + 0 \text{ in}^2 = 4.33 \text{ in}^2$$

$$\text{PERCENT OF COVERAGE} = \frac{4.33 \text{ in}^2}{9.15 \text{ in}^2} = 47.3 = 47.3\%$$

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 13LD-OUTLET-3E/
INLET-4-3 Item No: 805.070.007
805.130.015

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☐ 1 ☐ 2 ☒ cw ☒ ccw
FROM L _____ to L _____ INCHES FROM WO .125 to BEYOND
ANGLE: ☐ 0 ☒ 45 ☐ 60 other _____ 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 4 to BEYOND
ANGLE: ☐ 0 ☐ 45 ☐ 60 other _____ FROM 0 DEG to 36 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: David K. Zimmerman

Level: II

Date: 9-19-94

Sheet 1 of 3

Reviewed By: James F. McPherson

Date: 9-27-94

Authorized Inspector: Mike Klein

Date: 9-30-94

ATTACHMENT 5
PAGE 1 of 7

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 12:30 Form NDE (INS-2)
Exam Finish: 13:10 Revision 1

| | | | |
|------------------------------------|---|---|---------------------------------|
| Station: M ^c GUIRE | Unit: 1 | Component/Weld ID: 1 NCIF-1-6 | Date: 8/31/94 |
| Weld Length (in.): 97.4" | Surface Condition: AS GROUND | Lo: * | Surface Temperature: 79° deg. F |
| Examiner: J. J. Jones Level: II | Scans: 45 <input checked="" type="checkbox"/> 63 dB | Pyrometer S/N: MCNDE 27022 | |
| Examiner: J. J. Jones Level: II | 45T <input checked="" type="checkbox"/> 61.5 dB | Cal Due Date: 10/14/94 | |
| Procedure: NDE-611 Rev: 0 | FC: | Configuration: CIRC. WELD | |
| Calibration Sheet No: 9401058 & 59 | N/A | 52 → Flow → S1 → ELBOW to RC PUMP 1A | |
| | Other: _____ dB | Scan Surface: OD | |

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|----------------------------|--------|-------|-------|---------|---------|--------------------------------------|---------|---------|---------|----------------------------|------------|------|-------|
| | | | | | | | W1 | Mp1 | W2 | Mp2 | | | | |
| 4 | DO NOT WRITE IN THIS SPACE | | | | 20%dac | 20%dac | 20%dac | 20%dac | 20%dac | 20%dac | DO NOT WRITE IN THIS SPACE | | | |
| | | | | | HMA | HMA | HMA | HMA | HMA | HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Remarks: * OUTSIDE RADIUS OF ELBOW

| | |
|--|---|
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> (53.55%) | Sheet _____ of _____ |
| Reviewed By: C. D. Jolley | Level: II |
| Date: 9/13/94 | Authorized Inspector: [Signature] Date: 9-28-94 |
| | Item No: BOA.011.006 |

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: LCIF-1-6 Item No: B09.011.006

remarks:

☒ NO SCAN

SURFACE

BEAM DIRECTION

☐ LIMITED SCAN☒ 1 ☐ 2☐ 1 ☒ 2 ☒ cw ☒ ccwFROM L +0" to L +97.4" INCHES FROM WO E to BEYONDANGLE: ☐ 0 ☒ 45 ☐ 60 other FROM 0 DEG to 360 DEG☐ NO SCAN

SURFACE

BEAM DIRECTION

☐ LIMITED SCAN☐ 1 ☐ 2☐ 1 ☐ 2 ☐ cw ☐ ccwFROM 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 ☐ ccwFROM 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 ☐ ccwFROM L to L INCHES FROM WO to ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM DEG to DEG

Sketch(s) attached

☐ yes☒ noPrepared By: [Signature]Level: IIDate: 8/31/94Sheet of Reviewed By: C.D. [Signature]Date: 9/13/94Authorized Inspector: [Signature]Date: 9-28-94

Limited Exam Data Sheet

Station MC GUIRE Unit 1 I.D. # INCIF-1-6
By JAY EAST Date 9/12/94 Item # BOG.011.006
Checked By _____ Date _____ Page _____ Of _____

DETERMINING THE CUMULATIVE TOTAL OF WELD VOLUME INSPECTED (in percentage)

Total Cross Sectional Area 3.5 x (Number of Scans) 4 = 14.0 (% Factor)

Vessels:

Area Loss : Zone #1 _____
Zone #2 _____
Zone #3 _____

Total Zone Loss _____ / (% Factor) _____ x 100 = _____ % of Loss

Lump Sum Loss From Other Limitations + _____ %

Total Loss _____ %

100% - (Total Loss) _____ = _____ % of Coverage

(Additional _____ % of Partial Coverage)

Qualifies for Request for Relief ☐ Yes ☐ No

Piping:

Axial Scan * (Loss) _____ / _____ (% Factor) x 100 = 50 % of Loss

Circumferential Scan Over Root Area ☐ Yes ☒ No 42.9 % of Loss

Axial Loss _____ + Circ. Loss _____ = _____ / 2 = _____ % Loss

Additional Losses (Due to hangers, restraints, etc.) + _____ % Loss

Explain: *SEE ATTACHED SHEETS 46.45 Total % Loss

100% - (Total Loss) 46.45 = 53.55 % of Coverage

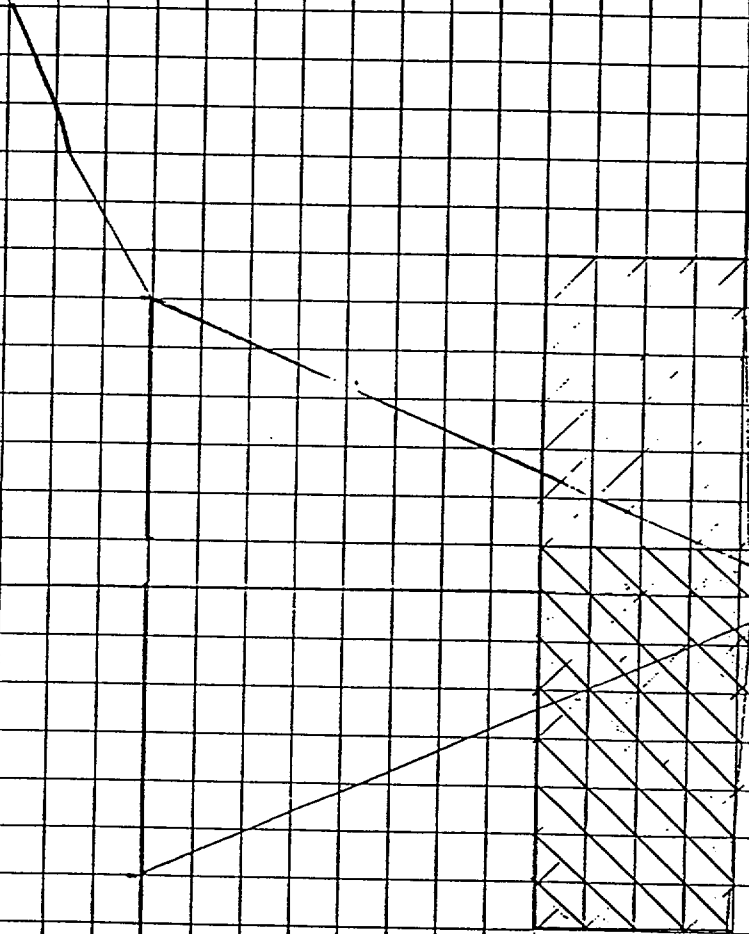
Qualifies for Request for Relief ☒ Yes ☐ No

Disposition: _____

By: _____ Date: _____

Station McGUIRE Unit 1 Rev. _____ File No. _____ Sheet _____ Of _____
 Subject WELD # 12C1F-1-6
 Item # B09.011.006 By JAY EATON Date 9/12/94
 Prob No. _____ Checked By _____ Date _____

CIRCUMFERENCE SCAD



TOTAL AREA OF INTEREST

$$1.0" \times 3.5" = 3.5 \text{ IN}^2$$

TOTAL AREA SCANNED

$$1.0" \times 2.0" = 2.0 \text{ IN}^2$$

% COVERAGE

$$2.0\% = \frac{2.0}{10.0} \times 100 = 20\%$$

$$\% \text{ LOSS} = 100 - 57.1 = 42.9\%$$

Station W-601RE Unit 1 Rev. _____ File No. _____ Sheet _____ of _____
 Subject WELD # 10C1F-1-6

Item # B09.011.006

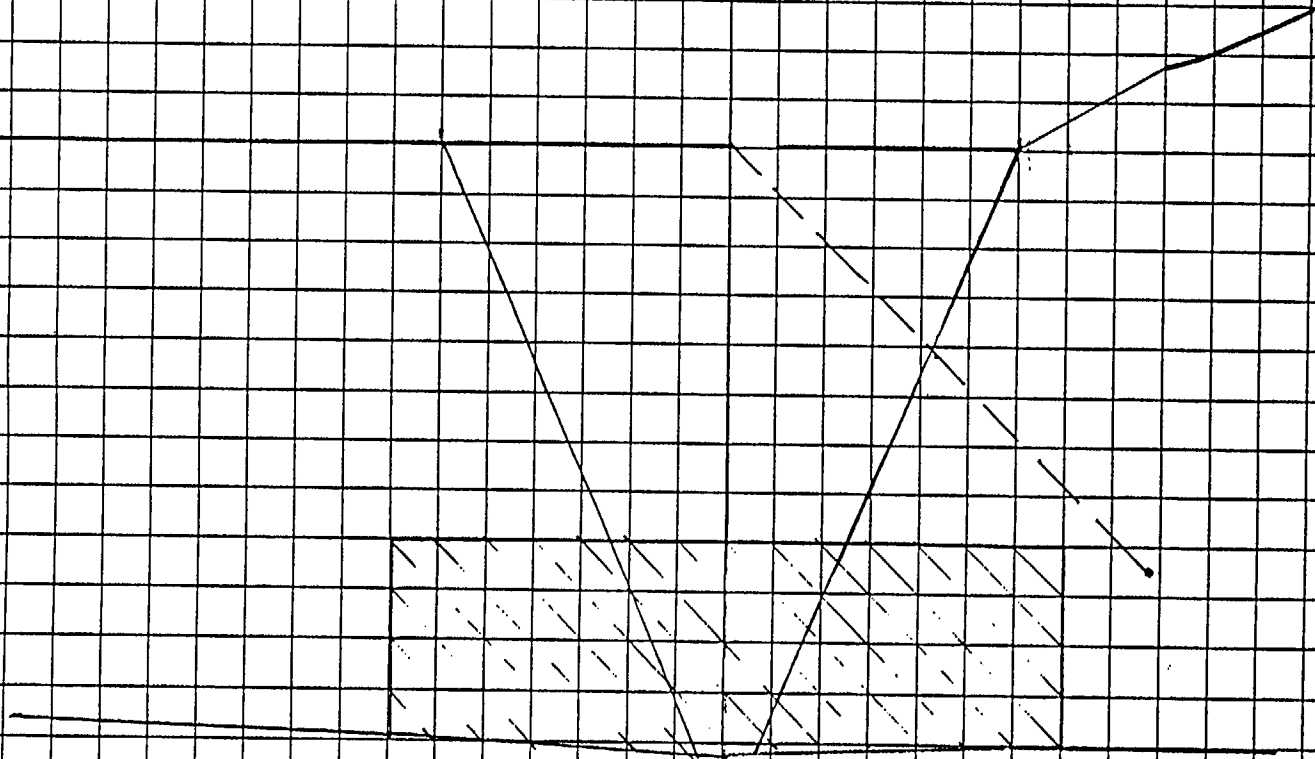
By JAN EATON

Date 9/12/94

Prob No. _____

Checked By _____

Date _____



SCAN FROM SZ - 100% SCAN COVERAGE AXIAL SCAN 100+0/2=

SCAN FROM S - 0%

"

"

"

"

50% TOTAL COVERAGE

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0150 Form NDE-UT-MNS-2

Exam Finish: 0204 Revision 1

Station: McGuire Unit: 1 Component/Weld ID: 1NC1F-1850 Date 4-28-93

Weld Length (in.): 20.81" Surface Condition: Buffed #1 Lo: Per B&W Surface Temperature: 77° deg. F

Examiner: *Wayne Houser* Level: II Scans: 45 ☒ 36 dB Pyromete S/N: MCQUA32849 Cal Due: 7-28-93

Examiner: *Carl Smith* Level: II 45T ☒ 47 dB Configuration: CIRC. WELD

Procedure: NDE 601 Rev: 0 FC: 60 ☒ 48 dB S2 Flow S1

Calibration Sheet No: 93-15 60T ☐ dB NOZZLE to ELBOW

193097 193098 193099 Other: dB Scan Surface: OD

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|-----------|--------|-------|-------|--|------------|--------------------------------------|----------------|---------------|----------------|----------|------------|------|-------|
| | | | | | 20%dac HMA | 20%dac HMA | W1 20%dac HMA | Mp1 20%dac HMA | W2 20%dac HMA | Mp2 20%dac HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | | | | |
| 45 | | | | | No Recordable Indications (Axial or Circ.) | | | | | | | | | |
| 60 | | | | | NO RECORDABLE INDICATIONS | | | | | | | | | |

Remarks: ONE SIDED EXAM

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒ Sheet 1 of 4

Reviewed By: *Rod Sheffield* Level: II Date: 5-5-93 Authorized Inspector: *OKlein* Date: 5-10-93 Item No: BO9.011.033

SERIAL NO. 98-001

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1001F 1850 Item No: B09.011.033

remarks: Cap width: 1.3"

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L 0 to L 20.80 INCHES FROM WO CLine to Beyond
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other FROM 0 DEG to 360 DEG

No Scan due to
nozzle

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
 FROM L 0 to L 20.80 INCHES FROM WO CLine to 1.05
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM 0 DEG to 360 DEG

Limited due to weld
and Haz 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: Wayne E. Houser

Level: III

Date: 4-28-93

Sheet 2 of 4

Reviewed By: Red [Signature]

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-7-93

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

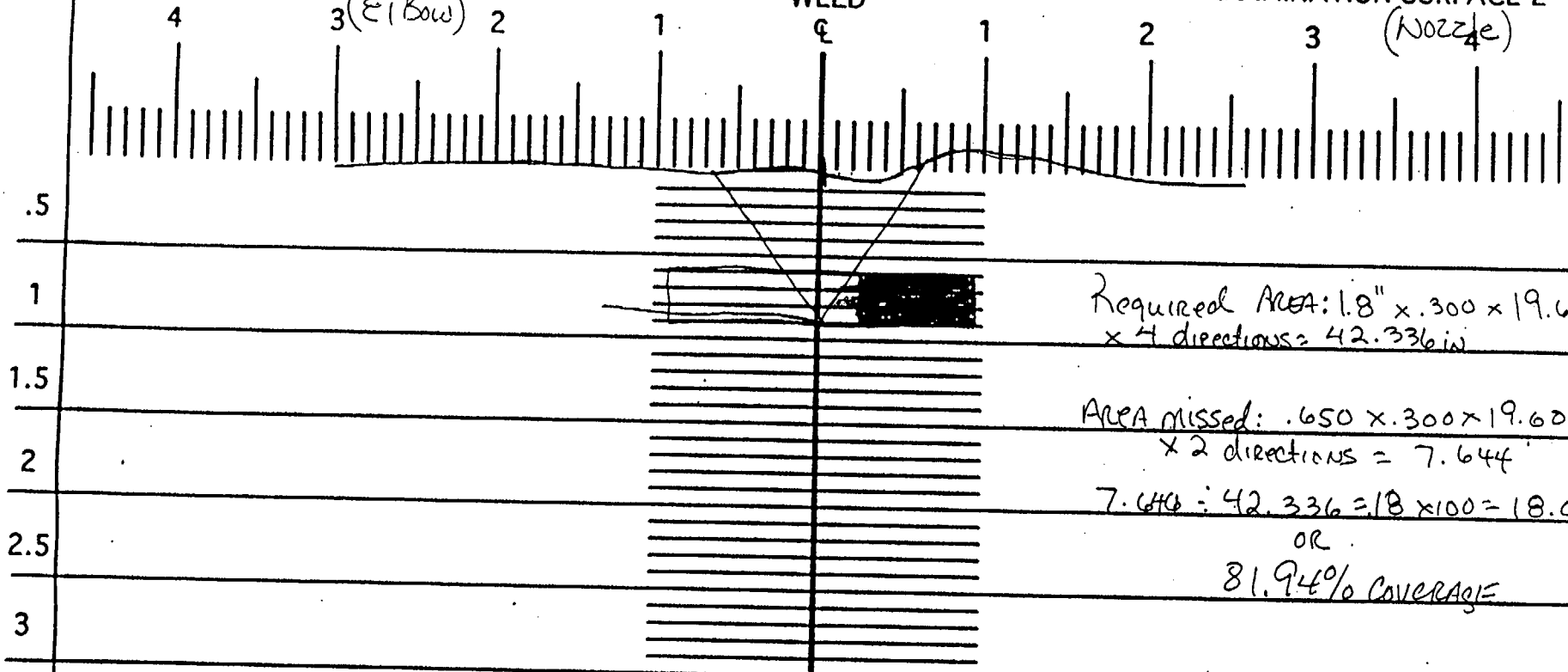
EXAMINATION SURFACE 1

EXAMINATION SURFACE 2

WELD

3 (El Bow)

3 (Nozzle)



Component ID/Weld No. INCL 1850

Remarks:

51 Haz: .840
Toe: .840
Cape: .900
62 Toe: nozzle
Haz: nozzle

Item No: B09.011.033

Examiner: Dave Langer

Level: II

Date: 4-28-93

Reviewed By: Red Sheffield

Level: II

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-93

270

Profile taken
at: 0°

90

180 Sheet 3 of 4

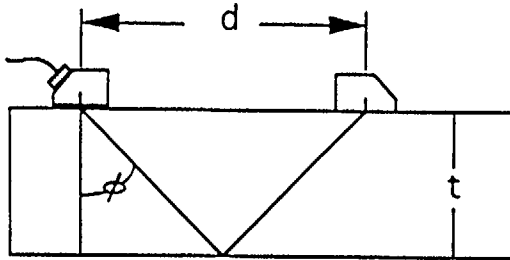
DUKE POWER COMPANY

ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

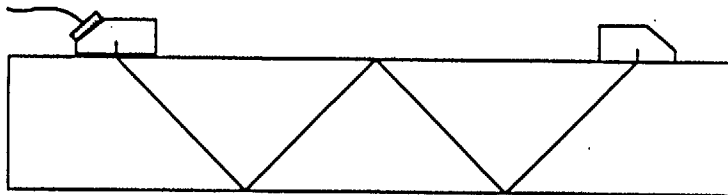
Form NDE-UT-9

Revision 0

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak signal from wedge.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. measure beam angle for each angle beam wedge used.
6. Use the measured beam angle to determine coverage and when plotting any indications.



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

Nominal 45 deg: d= 1.5"; t= .719"; measured angle= 46 deg ELBOW Side

Nominal 60 deg: d= 2.3"; t= .719"; measured angle= 58 deg

Weld ID: 1NC1F 1850

Item No: BO9.011.033

Examiner Dayle Houser Level II Date 4-28-93

Examiner Carl Level II Date 4-28-93

Reviewed By Rod Sheffield Level II Date 5-5-93

Authorized Inspector Mike Date 5-10-93

46/4

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0207

Form NDE-UT-MNS-2

Exam Finish: 0225

Revision 1

Station: McGuire

Unit: 1

Component/Weld ID: 1NC1F-539

Date 4-28-93

Weld Length (in.): 20.81"

Surface Condition: Buffed

#1
Lo: Per B&W

Surface Temperature: 77° deg. F

Examiner: *David E. Houser*

Level:

Scans: 45 ☒ 36 dB

Pyromete S/N: MCQUA32849

Cal Due: 7-28-93

Examiner: *Carl*

Level: II

45T ☒ 47 dB

Configuration: CIRC. WELD

Procedure: NDE 601

Rev: 0

FC:

60 ☒ 48 dB

S2 Flow S1

Calibration Sheet No:

93-15

60T ☐ dB

PIPE to ELBOW

193097 193098 193099

Other: dB

Scan Surface: OD

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|-----------|--------|-------|-------|--|------------|--------------------------------------|----------------|---------------|----------------|----------|------------|------|-------|
| | | | | | 20%dac HMA | 20%dac HMA | W1 20%dac HMA | Mp1 20%dac HMA | W2 20%dac HMA | Mp2 20%dac HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | | | | |
| 45 | | | | | NO RECORDABLE INDICATIONS (Axial or Circ.) | | | | | | | | | |
| 1 | 60 | 25 | 1.32 | 1.1 | 360 DEGREE INT. | | | | | | 1 | 2 | A | NO |
| 60 | | | | | NO OTHER RECORDABLE INDICATIONS | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐

no ☒

Sheet 1 of 5

Reviewed By:

Red Hefford

Level: II

Date:

5-5-93

Authorized Inspector

William

Date

5-10-93

Item No:

BO9.011.036

SERIAL NO. 98-001

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 11X21F539 Item No: 609.011.036

remarks: Cap width = 1"

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☐ cw ☐ ccw
 FROM L 0 to L 20.80 INCHES FROM WO Clave to .900
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other FROM 0 DEG to 360 DEG

Limited due to weld
and HAZ 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: Daryl E. Houser

Level: # Date: 4-28-93

Sheet 2 of 5

Reviewed By: Rod Sheffield

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-93

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2

WELD

4 (Elbow) 3

2

1

1

2

3 (pipe) 4

.5

1

1.5

2

2.5

3

Required Area = $.26 \times 1.5 \times 19.79$
x 4 dir = 30.87

Area Not Covered: $.600 \times .26 \times 19.79 \times 1$
dir = 3.08

Area Not Covered: $.675 \times .26 \times 19.79 \times 1$
dir = 3.473

Total Coverage = 78%

Component ID/Weld No. INE1F 539

Remarks:

SI Haz: .760

Toe: .760

Clave: .780

sa TDS: .700

Haz: .720

Item No: B09.011.036

Examiner: Doyle E. Houser

Level: II

Date: 4-28-93

Reviewed By: Rod Sheffield

Level: II

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-93

270

Profile taken
at: Indication

90

180 Sheet 3 of 5

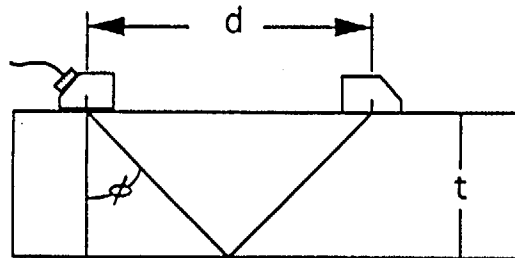
| DUKE POWER COMPANY | | | | | | | |
|--|----------------|---|----|--------------------|------------|-------------------------------------|-----------------|
| | | | | | NDE UT-8 | | |
| ULTRASONIC INDICATION RESOLUTION SHEET | | | | | Revision 0 | | |
| Station: | MCGUIRE | Unit: | 1 | Component/weld ID: | 1NC1F-539 | Item No: | BO9.011.036 |
| ACCEPTANCE STANDARD: | | N/A | | | | | |
| | | | | | | | |
| RESOLUTION: | | INDICATION NUMBER 1 HAS BEEN DETERMINED TO BE ID ROOT GEOMETRY. | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| ACCEPTABLE INDICATIONS: | | 1 | | | | | |
| REJECTABLE INDICATIONS: | | 0 | | | | | |
| These indications have been compared with previous ultrasonic data | | | | | | <input checked="" type="checkbox"/> | |
| Examiner: | Dave E. Hawser | Level: | II | Date: | 4-28-93 | sheet 4 of 5 | |
| Reviewed By: | Rod Sheffield | Level: | II | Date: | 5-5-93 | Authorized Inspector | Date 5-10-93 |

DUKE POWER COMPANY

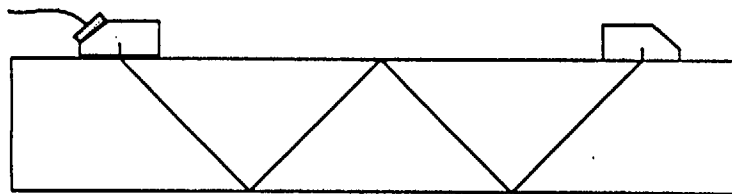
ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

Form NDE-UT-9

Revision 0



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

Nominal 45 deg: d= 1.5"; t= .719"; measured angle= 46 deg ELBOW Side

Nominal 60 deg: d= 2.3"; t= .719"; measured angle= 58 deg

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak signal from wedge.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. measure beam angle for each angle beam wedge used.
6. Use the measured beam angle to determine coverage and when plotting any indications.

Weld ID: 1NC1F 539

Item No: BO9.011.036

Examiner Wayne Houser Level II Date 4-28-93

Examiner Carl Level II Date 4-28-93

Reviewed By Red Sheffield Level Date

Authorized Inspector Reglein Date 5-10-93

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0228

Form NDE-UT-MNS-2

Exam Finish: 0242

Revision 1

Station: McGuire

Unit: 1

Component/Weld ID: 1NC1F-542

Date 4-28-93

Weld Length (in.): 20.81"

Surface Condition: Buffed

#1
Lo: Per B&W

Surface Temperature: 77° deg. F

Examiner: *Wayne Houser*

Level: II

Scans: 45 ☒ 36 dB

Pyromete S/N: MCQUA32849
Cal Due: 7-28-93

Examiner: *Carl Smith*

Level: II

45T ☒ 47 dB

Procedure: NDE 601 Rev: 0

FC:

60 ☒ 48 dB

Configuration: CIRC. WELD

Calibration Sheet No:

93-15

60T ☐ dB

S2 Flow S1

193097 193098 193099

NOZZLE to ELBOW

Other: dB

Scan Surface: OD

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|----------------------------|--------|-------|-------|--|------------------------------------|--|---|--|---|----------------------------|------------|------|-------|
| | | | | | 20%dac HMA 50%dac 100%dac | 20%dac HMA 50%dac 100%dac | W1 20%dac HMA 50%dac 100%dac | Mp1 20%dac HMA 50%dac 100%dac | W2 20%dac HMA 50%dac 100%dac | Mp2 20%dac HMA 50%dac 100%dac | | | | |
| | DO NOT WRITE IN THIS SPACE | | | | | | | | | | DO NOT WRITE IN THIS SPACE | | | |
| 45 | | | | | NO RECORDABLE INDICATIONS (Axial or Circ.) | | | | | | | | | |
| 60 | | | | | NO RECORDABLE INDICATIONS | | | | | | | | | |
| | | | | | | | | | | | | | | |

Remarks: ONE SIDED EXAM

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐

no ☒

Sheet 1 of 4

Reviewed By:

Level: II

Date: 5-5-93

Authorized Inspector

Date

Item No:

Paul Sheffield

II

5-5-93

Onyiah

5-10-93

BO9.011.040

SERIAL NO. 98-001

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: LN21F 542 Item No: B09.011.040

remarks: Cap width = 1.0"

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw

FROM L 0 to L 20.80 INCHES FROM WO CLine to Beyond

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

NO SCAN due to
NOZZLE

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw

FROM L 0 to L 20.80 INCHES FROM WO PLine to .900"

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

Limited Scan due to
Weld and Haz
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

Sketch(s) attached
☒ yes ☐ no

Prepared By: Wayne E. Houser

Level: III

Date: 4-28-93

Sheet 2 of 4

Reviewed By: Rod Sheffield

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-93

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

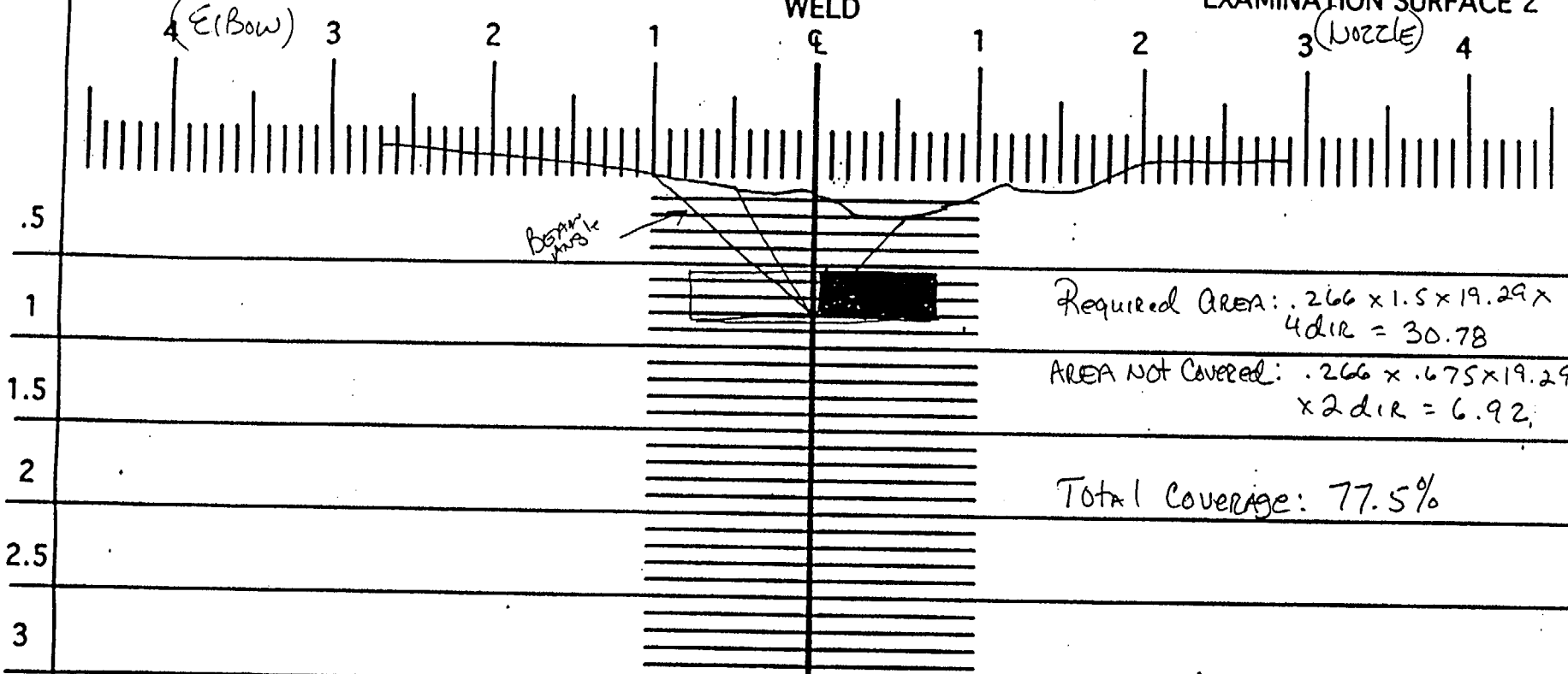
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2

WELD



Required Area: $.266 \times 1.5 \times 19.29 \times 4 \text{ dir} = 30.78$

Area Not Covered: $.266 \times .675 \times 19.29 \times 2 \text{ dir} = 6.92$

Total Coverage: 77.5%

Component ID/Weld No. INCIF 542

Remarks:

S1 Haz: .700

Bm: .740

Clue: .780

S2 Haz: nozzle

Bm: nozzle

Item No: B09.011.040

Examiner: Douglas E. Houser

Level: II

Date: 4-28-93

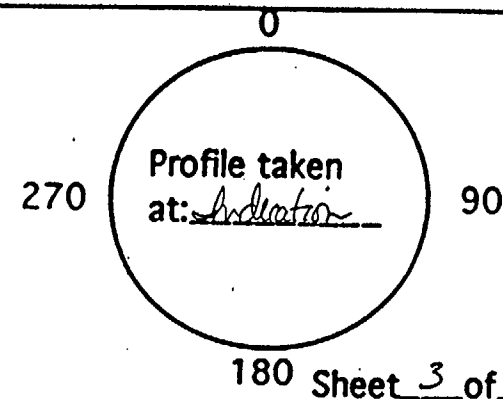
Reviewed By: Rod Sheffield

Level: II

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-97



180 Sheet 3 of 4

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0308

Form NDE-UT-MNS-2

Exam Finish: 0330

Revision 1

Station: McGuire

Unit: 1

Component/Weld ID: 1NC1F-544

Date 4-28-93

Weld Length (in.): 20.81"

Surface Condition: Buffed

#1
Lo: Per B&W

Surface Temperature: 77° deg. F

Examiner: *Jack Houser*

Level: II

Scans: 45 ☒ 36 dB

Pyromete S/N: MCQUA32849

Cal Due: 7-28-93

Examiner: *Carl Houser*

Level: II

45T ☒ 47 dB

Configuration: CIRC. WELD

Procedure: NDE 601 Rev: 0

FC:

60 ☒ 48 dB

S2 Flow S1

Calibration Sheet No:

93-15

60T ☐ dB

NOZZLE to ELBOW

193097 193098 193099

Other: dB

Scan Surface: OD

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|-----------|--------|-------|-------|--|------------|--------------------------------------|----------------|---------------|----------------|----------|------------|------|-------|
| | | | | | 20%dac HMA | 20%dac HMA | W1 20%dac HMA | Mp1 20%dac HMA | W2 20%dac HMA | Mp2 20%dac HMA | | | | |
| | | | | | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | 50%dac | | | | |
| | | | | | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | 100%dac | | | | |
| 1 | 45 | 25 | 1.08 | .75 | 360 DEGREE INT. | | | | | | 2 | 1 | A | NO |
| | 45 | | | | NO OTHER RECORDABLE INDICATIONS (AXIAL OR CIRC.) | | | | | | | | | |
| | 60 | | | | NO RECORDABLE INDICATIONS | | | | | | | | | |

Remarks: ONE SIDED EXAM

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☒

no ☐

Sheet 1 of 5

Reviewed By:

Level: II

Date: 5-5-93

Authorized Inspector

Date: 5-10-93

Item No:

BO9.011.047

SERIAL NO: 98-001

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: W01F 544 Item No: B09.011.047

remarks: Cap Width: 1"

☐ NO SCAN SURFACE BEAM DIRECTION

☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ CW ☐ CCW

FROM L 0 to L 20.80 INCHES FROM W0 0 Line to 900

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

☐ NO SCAN SURFACE BEAM DIRECTION

☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ CW ☐ CCW

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

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

☐ NO SCAN SURFACE BEAM DIRECTION

☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ CW ☐ CCW

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

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

☐ NO SCAN SURFACE BEAM DIRECTION

☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ CW ☐ CCW

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

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

Sketch(s) attached
☒ yes ☐ no

Prepared By: Dave E. Houser

Level: IS

Date: 4.28.93

Sheet 2 of 5

Reviewed By: Rod Hefner

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-93

ATTACHMENT 10

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

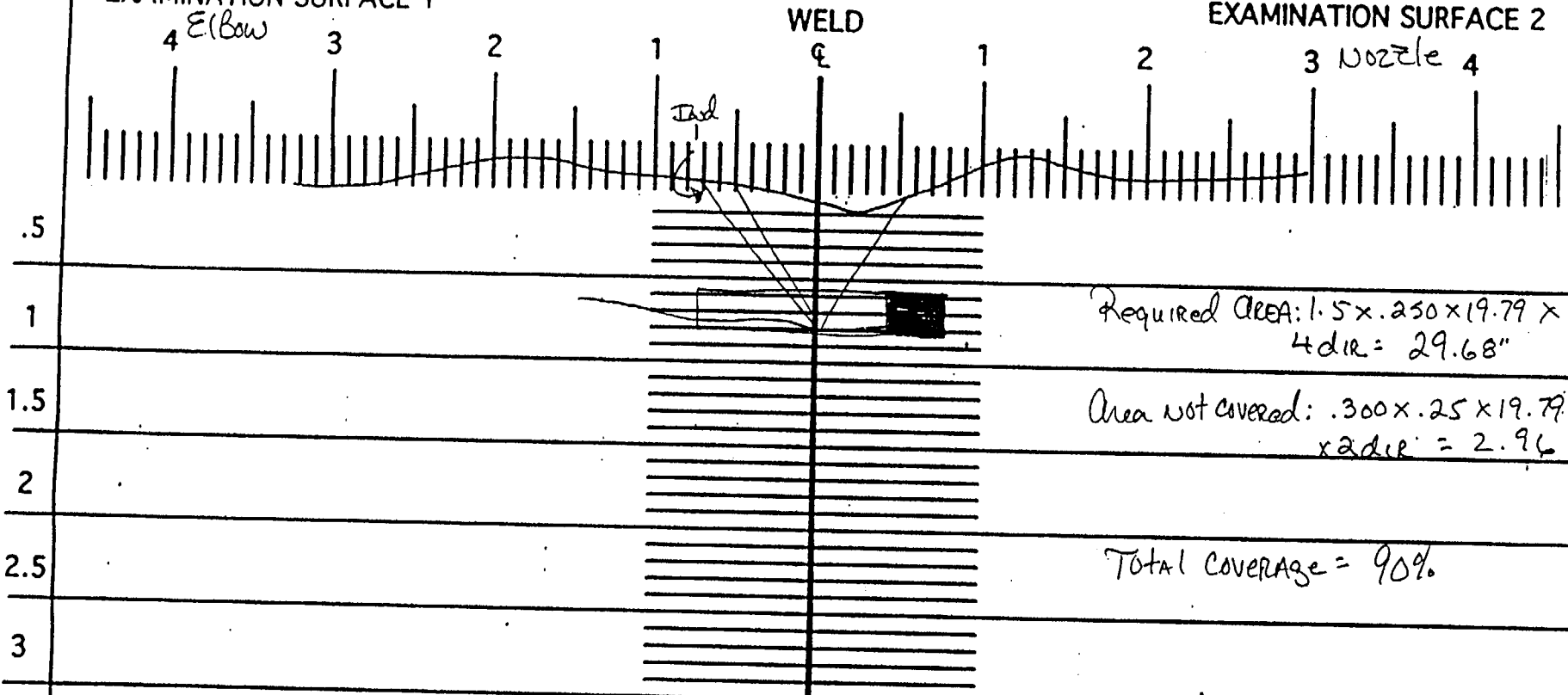
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2

WELD



Required Area: $1.5 \times .250 \times 19.79 \times 4 \text{ dir} = 29.68"$

Area not covered: $.300 \times .25 \times 19.79 \times 2 \text{ dir} = 2.96$

Total Coverage = 90%

Component ID/Weld No. INCIF 544

Remarks:

SI Haz: 740

TOE: .740

C Line: .740

22 TOE: .740

Haz: Nozzle

Item No: B09.011.047

Examiner: Wayne E. Hower

Level: II

Date: 4-28-93

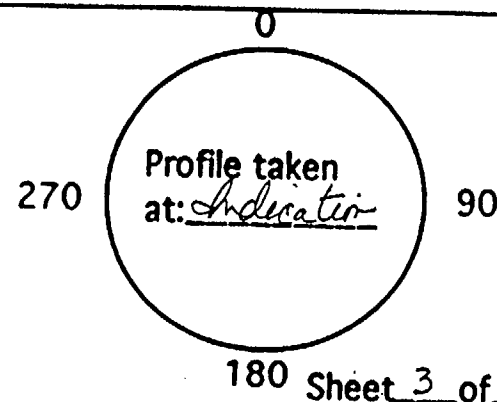
Reviewed By: Rod Sheffield

Level: II

Date: 5-5-93

Authorized Inspector: [Signature]

Date: 5-10-93



180 Sheet 3 of 5

[illegible]

Revision 0

Item No: BO9.011.047

RESOLUTION: INDICATION NUMBER 1 HAS BEEN DETERMINED TO BE ID ROOT GEOMETRY.

These indications have been compared with previous ultrasonic data

sheet 4 of 5

Authorized Inspector

Date
57073

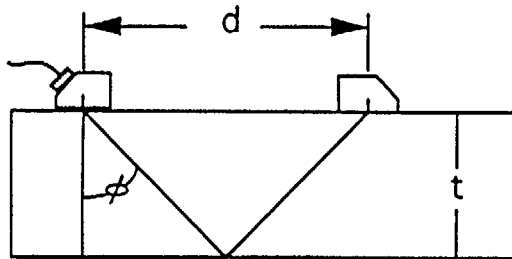
ATTACHMENT 10

DUKE POWER COMPANY

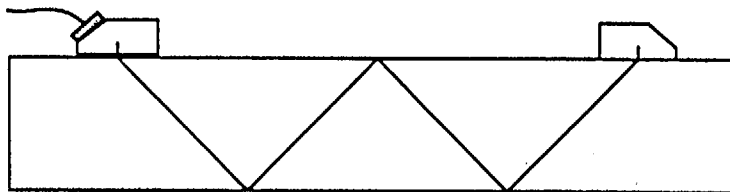
ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

Form NDE-UT-9

Revision 0



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

Nominal 45 deg: d= 1.5"; t= .719"; measured angle= 46 deg ELBOW Side
 Nominal 60 deg: d= 2.3"; t= .719"; measured angle= 58 deg

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak signal from wedge.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. measure beam angle for each angle beam wedge used.
6. Use the measured beam angle to determine coverage and when plotting any indications.

Weld ID: 1NC1F 544

Item No: BO9.011.047

Examiner Wayne Houser Level II Date 4-28-93

Examiner Carl [Signature] Level II Date 4-28-93

Reviewed By Rod Sheffield Level II Date 5-5-93

Authorized Inspector [Signature] Date 5-10-93

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0220

Form NDE-UT-M.

Exam Finish: 0235

Revision 1

Station: MCGUIRE NUCLEAR

Unit: 1

Component/Weld ID: 1NC1F 1746

Date: 4-27-93

Weld Length (in.): 14.13

Surface Condition: AS GROUND

Lo: 7.3.2C

Surface Temperature: 77 deg. F

Pyromete S/N: MCQUA 32849

Cal Due: 7-28-93

Examiner: *Cal*

Level: II

Scans: 45 ☒ 57 dB

Examiner: *Dark Hansen*

Level: I

45T ☒ 61 dB

Procedure: NDE 601 Rev: 0

FC: 93-15

60 ☒ 60 dB

Calibration Sheet No:

193091 - 193092 - 193093

60T ☐ dB

Other: dB

Configuration: NOZZLE

1 Flow 2

NOZZLE to ELBOW

Scan Surface: OD

| IND # | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps |
|-------|----------------------------|--------|---------------------------------|-------|------------------------------------|------------------------------------|--|---|--|---|----------------------------|------------|------|-------|
| | | | | | 20%dac HMA 50%dac 100%dac | 20%dac HMA 50%dac 100%dac | W1 20%dac HMA 50%dac 100%dac | Mp1 20%dac HMA 50%dac 100%dac | W2 20%dac HMA 50%dac 100%dac | Mp2 20%dac HMA 50%dac 100%dac | | | | |
| | DO NOT WRITE IN THIS SPACE | | | | | | | | | | DO NOT WRITE IN THIS SPACE | | | |
| | 45 | | NO RECORDABLE INDICATIONS | | | | | | | | | | | |
| 1 | 60 | 50 | 1.0 | .80 | 360 DEGREES | | | | | | | | | |
| | 60 | | NO OTHER RECORDABLE INDICATIONS | | | | | | | | | | | |

Remarks:

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐

no ☒

Sheet 1 of 5

Reviewed By:

Level: II

Date: 5-5-93

Authorized Inspector

Date

Item No:

Rod Sheffield

II

5-5-93

Adrian

5-10-93

B09.011.066

SERIAL NO. 98-001

ATTACHMENT II

DUKE POWER COMPANY
UT PROFILE/PLOT SHEET

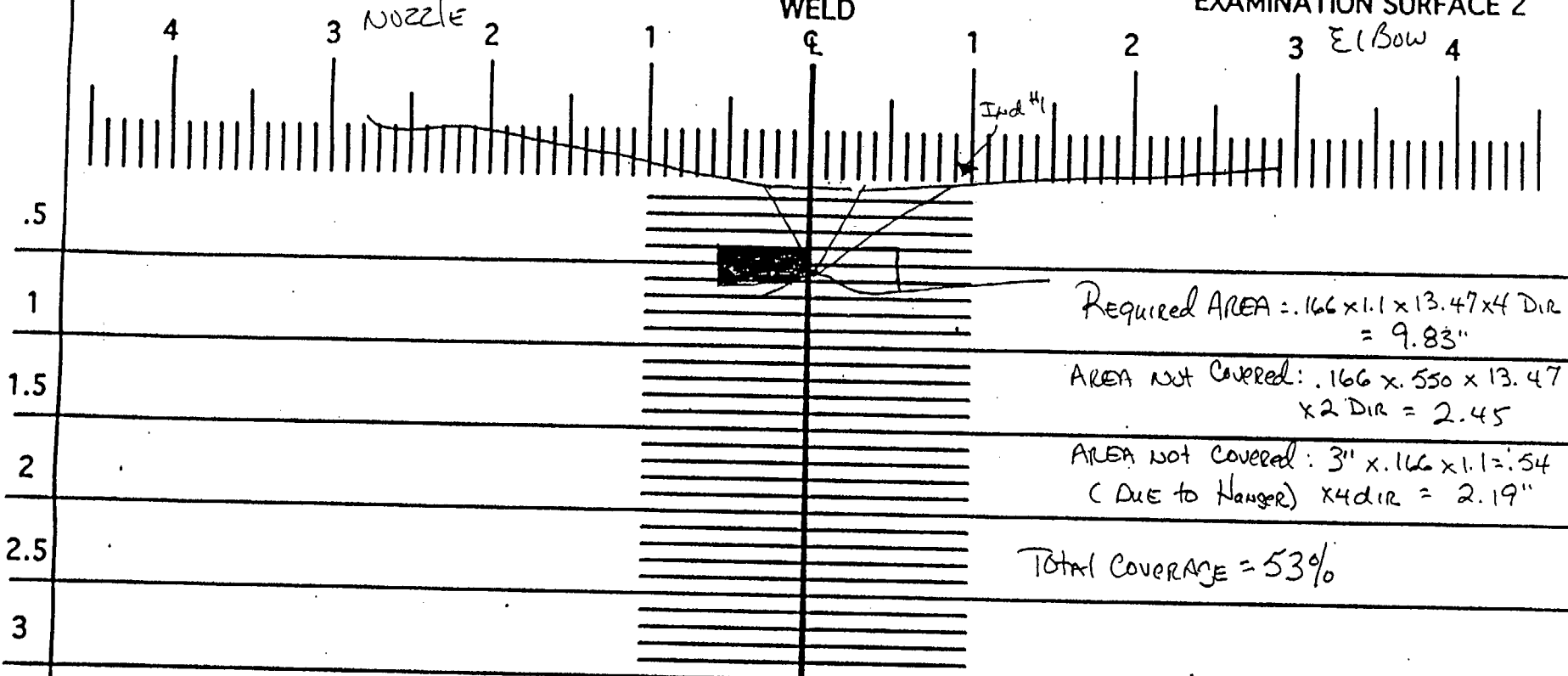
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1 NCIF -1746

: Remarks: 1 Sided Exam due to Nozzle

S1 Haz: nozzle

Bm: .640

S2 CLINE: .500

Bm: .600

Haz: .600

Item No: B09. 011. 066

Examiner: Dante E. Houser

Level: II

Date: 4.27.93

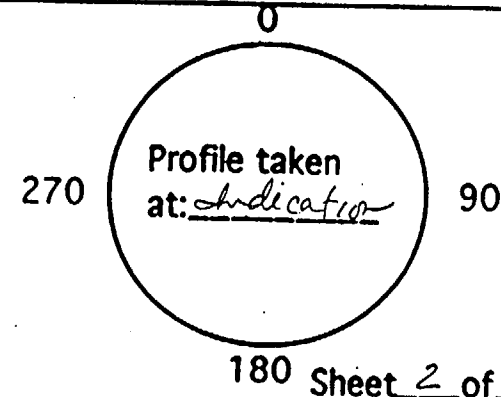
Reviewed By: Rod Sheffield

Level: II

Date: 5.5.93

Authorized Inspector: [Signature]

Date: 5-10-93



180 Sheet 2 of 5

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: INEL 1746 Item No: B 09.011.066

remarks: Cap Width = .600"

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
 FROM L 0 to L 14.13 INCHES FROM WO Clive to Beyond
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other FROM 0 DEG to 360 DEG

No SCAN due to Nozzle

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
 FROM L 1.5" to L 12.63 INCHES FROM WO Clive to .700
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other FROM Na DEG to Na DEG

Limited due to weld
Clown and hz configuration

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw
 FROM L 12.63 to L 1.5" INCHES FROM WO Clive to Beyond
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other FROM Na DEG to Na DEG

No SCAN due to
Permanent Hauser

☐ 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

Sketch(s) attached
☐ yes ☐ no

Prepared By: Dave E. Bowen

Level: II Date: 4-27-93

Sheet 3 of 5

Reviewed By: Rod Sheffield

Date: 5-5-93

Authorized Inspector: Mike

Date: 5-10-93

ATTACHMENT 11

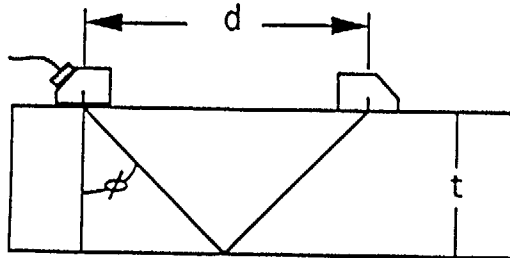
[illegible]

DUKE POWER COMPANY

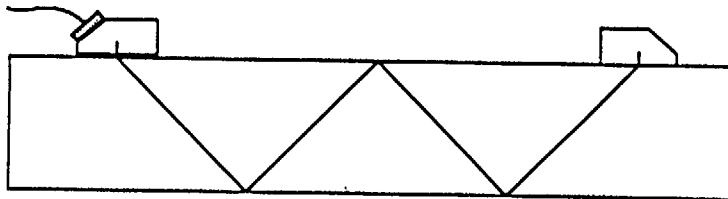
ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

Form NDE-UT-9

Revision 0



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak signal from wedge.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. measure beam angle for each angle beam wedge used.
6. Use the measured beam angle to determine coverage and when plotting any indications.

Weld ID: 1NC1F 1746

Item No: BO9.011.066

Nominal 45 deg: d= .95"; t= .531"; measured angle= 42 deg ELBOW Side

Nominal 60 deg: d= 1.9"; t= .531"; measured angle= 59.61 deg 60

| | | |
|-------------------------------------|--------------------|------------------------|
| Examiner <i>Carl Smith</i> | Level <i>II</i> | Date <i>4-27-93</i> |
| Reviewed By <i>Rod Sheffield</i> | Level <i>II</i> | Date <i>5-5-93</i> |

| | | |
|--|--------------------|------------------------|
| Examiner <i>Wayle Houser</i> | Level <i>II</i> | Date <i>4.27.93</i> |
| Authorized Inspector <i>Reglein</i> | | Date <i>5-10-93</i> |

5 of 5

ATTACHMENT 11

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 11:35

Form NDE-UT-MNS-2

Exam Finish: 11:46

Revision 1

Station: **McGUIRE**

Unit: 1

Component/Weld ID: 1NC47-WN4A

Date: 4-1-93

Weld Length (in.): 48.5"

Surface Condition: **Buffed**

Lo: * see notes

Surface Temperature: 68 deg. F

Examiner: *Larry Thaulden*

Level: II

Scans: 45 ☒ 56.5 dB

Pyromete S/N: MCQUA32843

Cal Due: 7-28-93

Examiner: *Carl Jones*

Level: II

45T ☒ 56.5 dB

Configuration: **Branch Connection**

Procedure: **NDE 611** Rev: 0

FC:

60 ☐ dB

S1 Flow S2


Calibration Sheet No: 193033

60T ☐ dB

Pipe to Branch

Other: dB

Scan Surface: OD

| Scan Surface: OD | | | | | | | | | | | | | | | | |
|------------------|---|-----------------|--|----------|----------|------------------------------------|------------------------------------|--|---|--|---|-------------------------------|---------------|------|-------|--|
| IND # |  | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps | |
| | DO NOT WRITE IN THIS SPACE | | | | | 20%dac HMA 50%dac 100%dac | 20%dac HMA 50%dac 100%dac | W1 20%dac HMA 50%dac 100%dac | Mp1 20%dac HMA 50%dac 100%dac | W2 20%dac HMA 50%dac 100%dac | Mp2 20%dac HMA 50%dac 100%dac | DO NOT WRITE IN THIS SPACE | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | 45° | | No Recordable Indications (Axial or Circ.) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Remarks: * Upstream apex of branch connection

Limitations: (see NDE-UT-4) ☒

90% or greater coverage obtained: yes ☐

no ☒

Sheet 1 of 6

Reviewed By:

Level: II

Date: 4-6-93

Authorized Inspector

Date

Item No:

B09.031.001

SERIAL NO. 98-001

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1NC47-WN4 Item No: B09.031.001

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw

Due to nozzle
configuration

FROM L _____ to L _____ INCHES FROM WO 0.0" & Beyond
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other 45°L 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

☐ 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

Sketch(s) attached
☐ yes ☐ no

Prepared By: Larry Maudlin

Level: II Date: 4-1-93

Sheet 2 of 6

Reviewed By: Rod Sheffield

Date: 4-6-93

Authorized Inspector: [Signature]

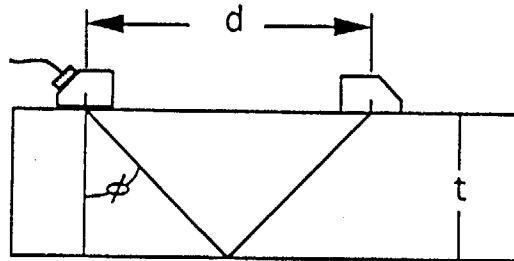
Date: 4-8-93

DUKE POWER COMPANY

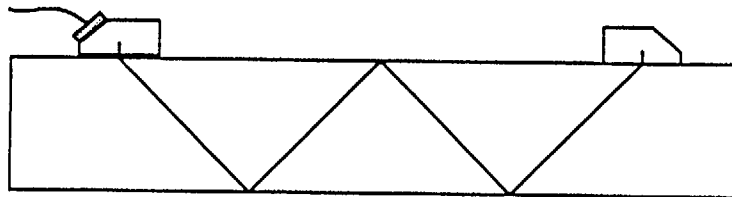
ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

Form NDE-UT-9

Revision 0



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

Nominal 45 deg: d=*2.48"; t=2.48"; measured angle=45 deg

Nominal 60 deg: d= ; t= ; measured angle= deg

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak signal from wedge.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. measure beam angle for each angle beam wedge used.
6. Use the measured beam angle to determine coverage and when plotting any indications.

Weld ID: 1NC47-WN4A

Item No: B09.031.001

| | | |
|-------------------------------------|--------------------|-----------------------|
| Examiner <i>Larry Thaulder</i> | Level <i>II</i> | Date <i>4-1-93</i> |
| Reviewed By <i>Rod Sheffield</i> | Level <i>II</i> | Date <i>4-6-93</i> |

| | | |
|--|--------------------|-----------------------|
| Examiner <i>Carl J. Jura</i> | Level <i>II</i> | Date <i>4-1-93</i> |
| Authorized Inspector <i>Pat Klein</i> | | Date <i>4-8-93</i> |

* Angle check was done on the notch of the calibration block (50214).

3 of 6

Station MC GUIRE Unit 1 Rev. _____ File No. INC 47-WN4A Sheet 4 Of 6
 Subject LIMITED EXAM DATA

By Larry Trautman Date 4-5-93
 Prob No. B09.031.001 Checked By Carl [Signature] Date 4-5-93

DRAWING #1

$$\begin{array}{r} \text{CROSS SECTIONAL AREA} = .766 \times 2.1 = 1.608 \text{ sq. in.} \\ \times \quad \quad \quad 2 \text{ SCANS} \\ \hline 3.217 \text{ sq. in.} \end{array}$$

AREA OF LOSS:

$$\begin{array}{l} \text{AXIAL} - 1.608 \div 3.217 \times 100 = 50\% \\ \text{CIRC.} - \text{NO LOSS} \end{array}$$

DRAWING #2

$$\begin{array}{r} \text{CROSS SECTIONAL AREA} = .766 \times 2.1 = 1.608 \text{ sq. in.} \\ \times \quad \quad \quad 2 \text{ SCANS} \\ \hline 3.217 \text{ sq. in.} \end{array}$$

AREA OF LOSS:

$$\begin{array}{l} \text{AXIAL} - \frac{.33 \times .33}{2} + 1.608 = 1.669 \\ 1.669 \div 3.217 \times 100 = 51.88\% - 52\% \\ \text{CIRC.} \quad \quad 100\% \end{array}$$

| | AXIAL (LOSS) | CIRC. | |
|------------|----------------|----------------|-----------------------|
| DRAWING #1 | 50% | 0% | |
| DRAWING #2 | 52% | 100% | 51 |
| | $102\% = 51\%$ | $100\% = 50\%$ | <u>50</u> |
| | | | $101 \div 2 = 50.5\%$ |

A 45° L-WADE WAS USED TO SCAN WELD FROM 1 DIRECTION ONLY. NO SCAN WAS PERFORMED FROM SURFACE 2 (NOZZLE SIDE) DUE TO NOZZLE / WELD CONFIGURATION.

NO OTHER LIMITATIONS

QUALITIES FOR REQUEST FOR RELIEF

AREA OF COVERAGE IS 100% - AREA OF LOSS (50.5%) = 49.5%

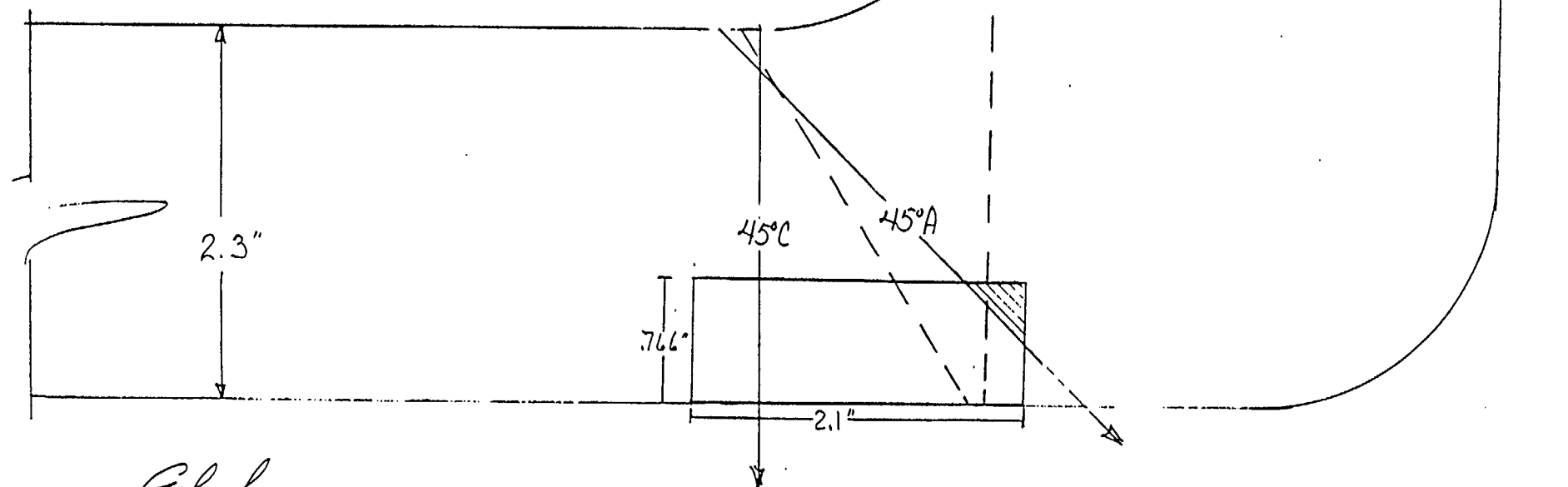
10" S/S Nozzle

DRAWING # 2

ITEM # B09.031.001

□ - AREA SCANNED

▨ - AREA NOT SCANNED

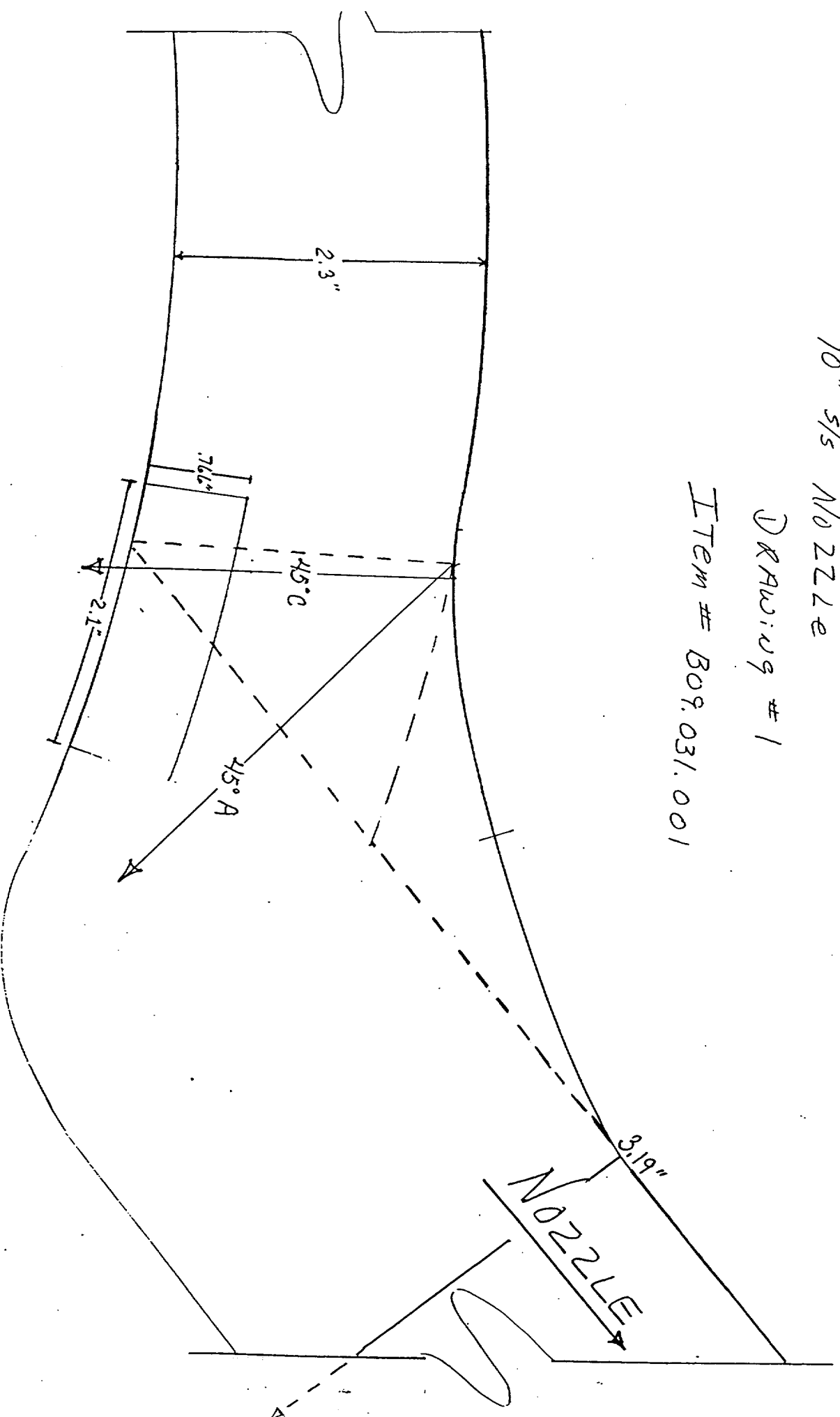


Carl J. J.

10" S/S NOZZLE

DRAWING # 1

ITEM # BOG.031.001



Carl Spurr

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1NC47-WN4B Item No: B09.031.002

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw
 FROM L _____ to L _____ INCHES FROM WO 0.0" & Beyond
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other 45° FROM _____ DEG to _____ DEG

Due to nozzle

configuration

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☒ cw ☒ ccw
 FROM L 19" to L 21" INCHES FROM WO 3.0" & Beyond
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other 45° FROM _____ DEG to _____ DEG

Due to welded I.D. Tag

☐ 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

Sketch(s) attached

☐ yes

☐ no

Prepared By: Larry Thaulden

Level: II

Date: 4-1-93

Sheet 2 of 8

Reviewed By: Rod Sheffield

Date: 4-6-93

Authorized Inspector: Chapman

Date: 4-8-93

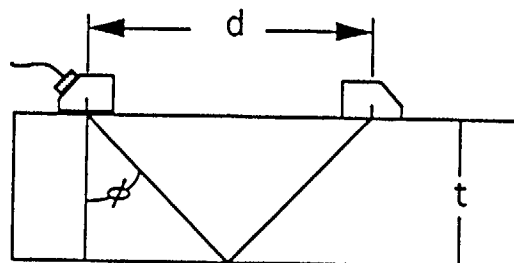
ATTACHMENT 13

DUKE POWER COMPANY

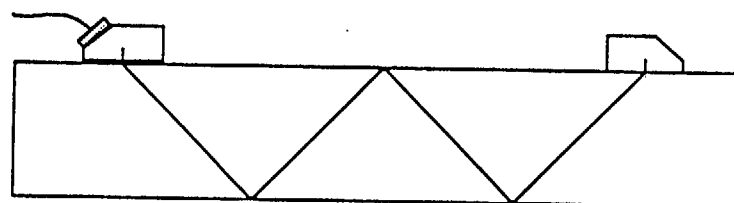
ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

Form NDE-UT-9

Revision 0



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

Nominal 45 deg: d=*2.48"; t= 2.48"; measured angle= 45 deg

Nominal 60 deg: d=____; t=____; measured angle=____ deg

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak signal from wedge.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. measure beam angle for each angle beam wedge used.
6. Use the measured beam angle to determine coverage and when plotting any indications.

Weld ID: 1NC47-WN4B

Item No: B09.031.002

| | | | | | |
|-------------------------------------|--------------------|-----------------------|--|-----------------------|-----------------------|
| Examiner <i>Larry Mauldin</i> | Level <i>II</i> | Date <i>4-1-93</i> | Examiner <i>Carl Jones</i> | Level <i>II</i> | Date <i>4-1-93</i> |
| Reviewed By <i>Rod Sheffield</i> | Level <i>II</i> | Date <i>4-6-93</i> | Authorized Inspector <i>W. J. Klein</i> | Date <i>4-8-93</i> | |

* Angle check was done on the notch of the calibration block (50214).

3 of 8

ATTACHMENT 13
PAGE 3 OF 8

Station McGUIRE Unit 1 Rev. _____ File No. 1NC47-WN4B Sheet 4 Of 8
 Subject LIMITED EXAM DATA

By Larry Mauldin Date 4-5-91
 Prob No. B09.031.002 Checked By Carl Date 4-5-93

DRAWING #1

CROSS SECTIONAL AREA: $.766 \times 2.1 = 1.608 \text{ sq. in.}$
 $\times 2 \text{ SCANS}$
 3.217 sq. in.

AREA OF LOSS:

AXIAL - $1.608 \div 3.217 \times 100 = 50\%$

CIRC. - NO LOSS

DRAWING #2

CROSS SECTIONAL AREA: $.766 \times 2.1 = 1.608 \text{ sq. in.}$
 $\times 2 \text{ SCANS}$
 3.217 sq. in.

AREA OF LOSS:

AXIAL - $\frac{.35 \times .35}{2} + 1.608 = 1.669 \div 3.217 \times 100 = 51.52\%$

CIRC. - 100%

DRAWING #1 AXIAL (LOSS) 50% CIRC. 0%

DRAWING #2 52% 100%

$102 \div 2 = 51$

$100 \div 2 = 50$

$51 + 50 \div 2 = 50.5\%$

OTHER LIMITATIONS - I.D. TAG

DRAWING #3

CROSS SECTIONAL AREA $.766 \times 2.1 = 1.608 \text{ sq. in.}$
 LENGTH OF WELD 48.5 in.

AREA OF LOSS $.3 \times .766 + \frac{.766 \times .766}{2} = .523 \text{ sq. in.}$

I.D. TAG LENGTH 2 in.

1046 cu. in.

ADDITIONAL LOSS $1.046 \div 77.988 \times 100 = 1.34\% = 1.3\%$

(NEXT PAGE)

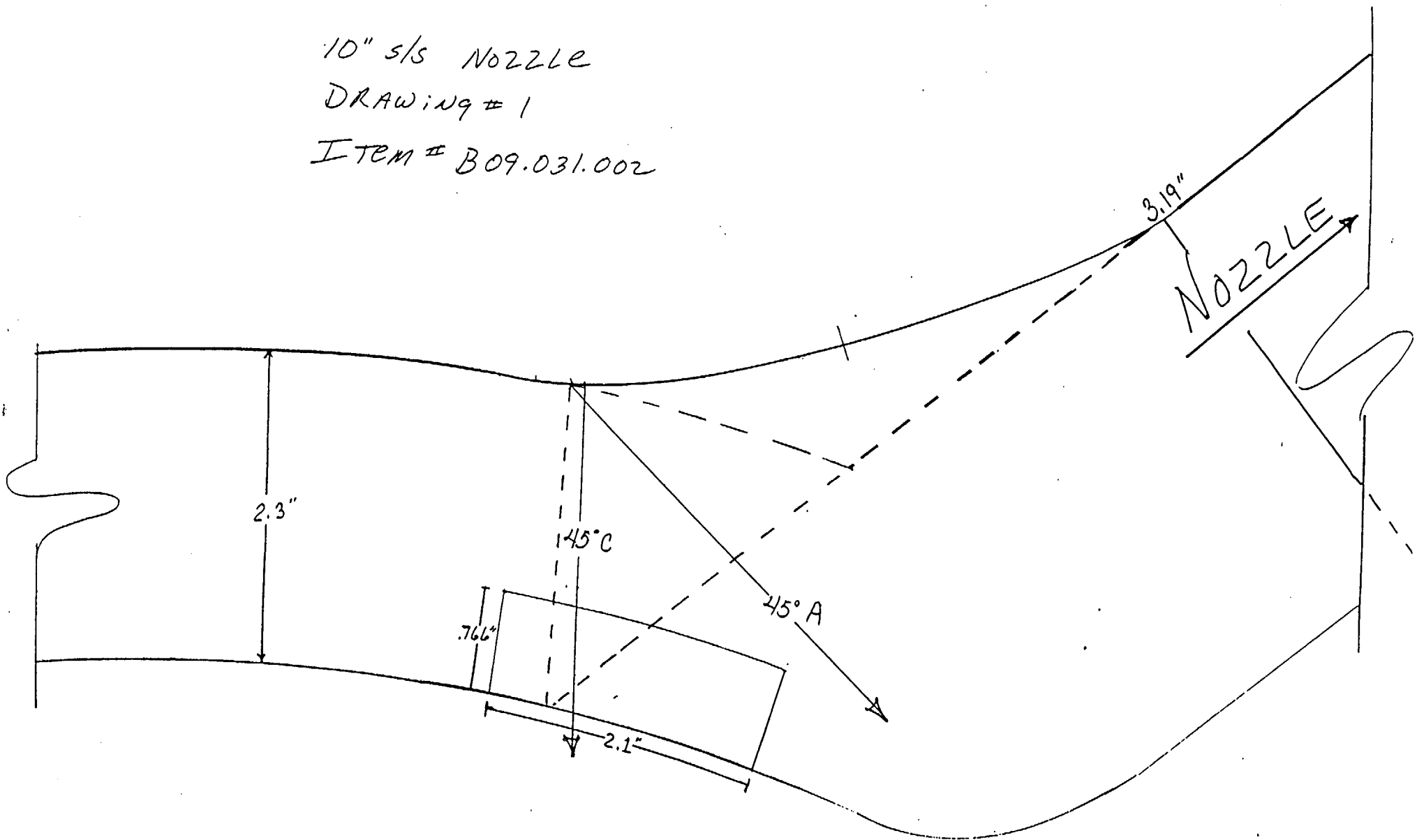
Station McGUIRE Unit 1 Rev. _____ File No. 1 NC 47-WN 48 Sheet 5 Of _____
Subject LIMITED EXAM DATA
By Larry Mauldin Date 4.5.9
Prob No. B 09.031.002 Checked By _____ Date _____

DRAWING #3 LOSS 1.3%
AVERAGE of DRAWINGS 1 & 2 50.5%
51.8% AMOUNT of LOSS
 $100\% - 51.8\% = 48.2\%$ COVERAGE

Qualities for Request for Relief
AREA of COVERAGE is 48.2%

∴ A 45° L-WAVE WAS USED TO SCAN WELD FROM 1 DIRECTION ONLY. NO SCAN WAS PERFORMED FROM SURFACE 2 (NOZZLE SIDE) DUE TO NOZZLE/WELD CONFIGURATION.

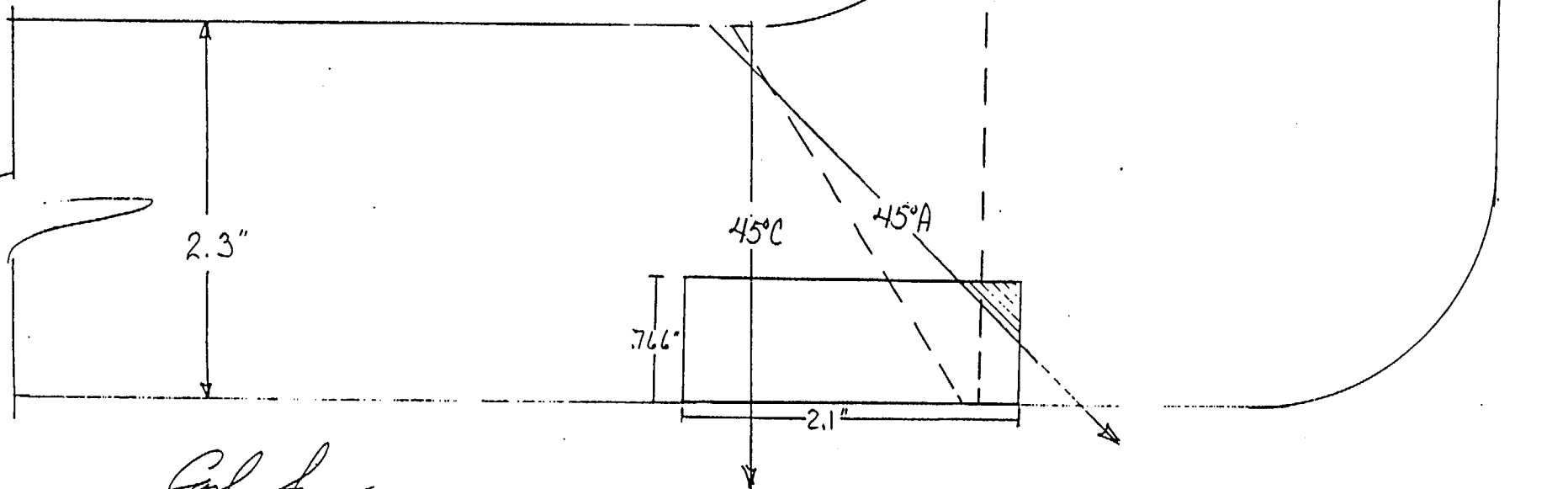
10" S/S NOZZLE
DRAWING # 1
ITEM # B09.031.002



Carl Smith

10" s/s Nozzle
Drawing #2
Item # B09.031.002

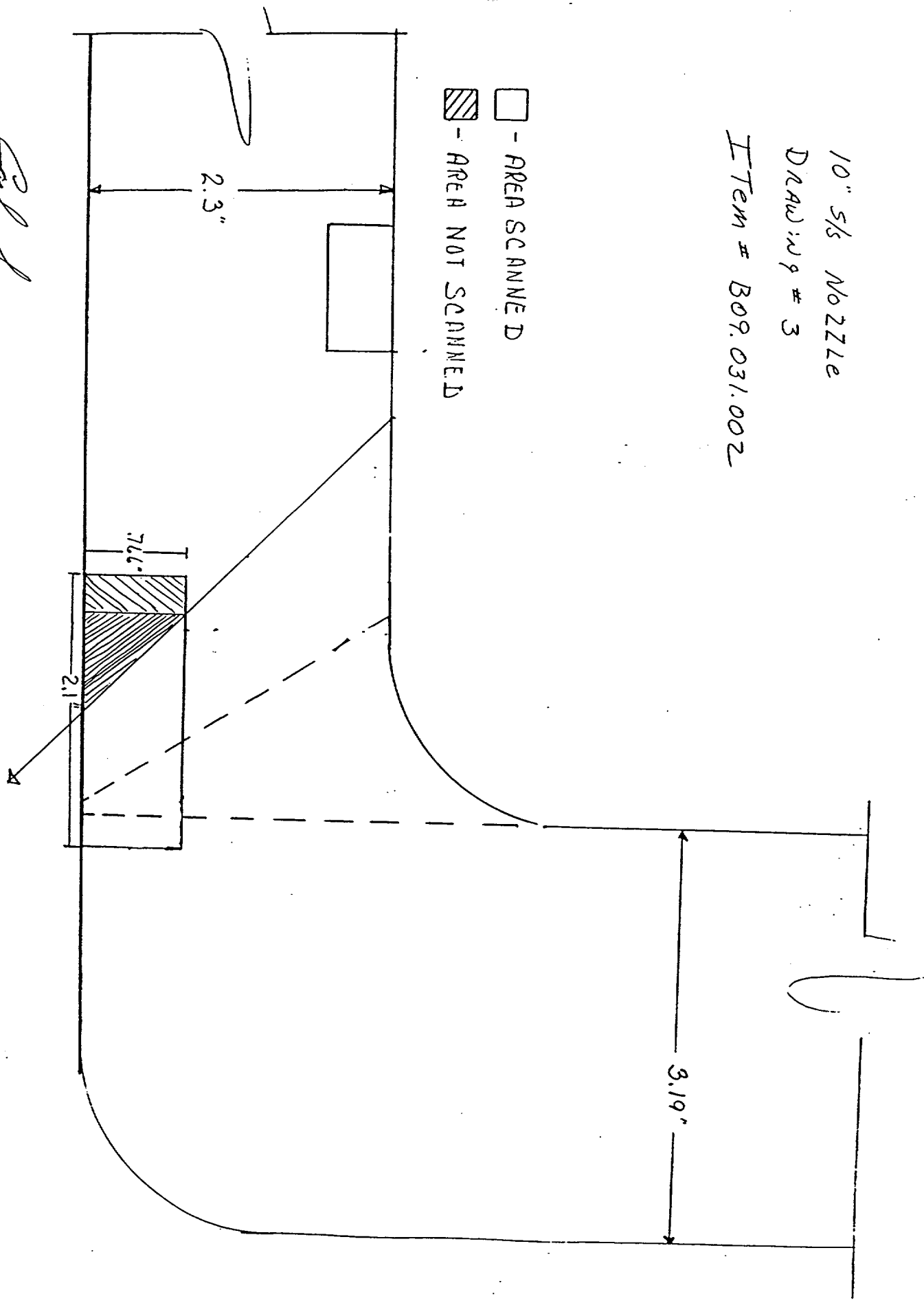
□ - AREA SCANNED
▨ - AREA NOT SCANNED



10" 5/8 Nozzle
Drawing # 3

Item # B09.031.002

- ☐ - AREA SCANNED
- ☒ - AREA NOT SCANNED



Carl Brown

| DUKE POWER COMPANY | | | | | | | | | | Exam Start: 1003 | | Form NDE-UT-MISC-2 | | | | |
|---|-----|--|---------------------------|--------------|--|------------------------------------|------------------------------------|--|---|--|---|----------------------------|------------|------|-------|--|
| ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS | | | | | | | | | | Exam Finish: 1025 | | Revision 1 | | | | |
| Station: McGuire | | | Unit: 1 | | Component/Weld ID: 1NC47-WN6 | | | | | Date: 8-25-94 | | | | | | |
| Weld Length (in.): 63.0" | | | Surface Condition: Buffed | | | PER NDE 90 Lo: 9.1.1.6 | | Surface Temperature: 85 deg. F | | | | | | | | |
| Examiner: Richard B Childers | | | Level: II | | Scans: 45 <input checked="" type="checkbox"/> 55.5* dB 45T <input checked="" type="checkbox"/> 55.5* dB 60 <input type="checkbox"/> _____ dB 60T <input type="checkbox"/> _____ dB Other: _____ dB | | | | Pyromete S/N: MCNDE27022 | | | | | | | |
| Examiner: Gary Moss | | | Level: II | | | | | | Cal Due: 10-14-94 | | | | | | | |
| Procedure: NDE 611 Rev: 0 | | | FC: | | | | | | Configuration: Branch Connection | | | | | | | |
| Calibration Sheet No: 9401045 | | | N/A | | | | | | S1 Flow S2 Pipe to Branch | | | | | | | |
| | | | | | | | | | | Scan Surface: OD | | | | | | |
| IND # | | Max % DAC | Mp Max | W Max | L Max | L1 | L2 | Applies only to NDE-621, 641 and 681 | | | | Beam Dir | Exam surf. | Scan | Damps | |
| | | | | | | 20%dac HMA 50%dac 100%dac | 20%dac HMA 50%dac 100%dac | W1 20%dac HMA 50%dac 100%dac | Mp1 20%dac HMA 50%dac 100%dac | W2 20%dac HMA 50%dac 100%dac | Mp2 20%dac HMA 50%dac 100%dac | DO NOT WRITE IN THIS SPACE | | | | |
| | 45° | No Recordable Indications (Axial or Circ.) | | | | | | | | | | | | | | |
| Remarks: * SCANNED REF. DB DUE TO NOISE LEVEL | | | | | | | | | | | | | | | | |
| Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | |
| Reviewed By: C. D. Kelley | | Level: II | | Date: 9/6/94 | | Authorized Inspector: [Signature] | | | | Date: 9-28-94 | | Item No: B09.031.003 | | | | |
| Sheet _____ of _____ | | | | | | | | | | | | | | | | |

SERIAL NO. 98-001

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: INC 47-WN6 Item No: B09.031.003

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
 FROM L _____ to L _____ INCHES FROM WO .5 to BEYOND
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other _____ FROM 35 DEG to 225 DEG

DUE TO WELD TAPER

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
 FROM L _____ to L _____ INCHES FROM WO .5 to BEYOND
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other _____ FROM 315 DEG to 45 DEG

DUE TO WELD TAPER

☐ 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

0° IS TOP OF PIPE
ON Pump SIDE OF
NOZZLE

☐ 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

Sketch(s) attached
☒ yes ☐ no

Prepared By: Sam Moss

Level: II

Date: 8-25-94

Sheet _____ of _____

Reviewed By: C.D. Jolley

Date: 9/6/94

Authorized Inspector: [Signature]

Date: 9-28-94

Station INC GUIRE Unit 1 Rev. _____ File No. INC 47-WN Sheet _____ Of _____
 Subject LIMITED EXAM DATA
 By Larry Thawlin Date 8-25-94
 Prob No. B09.031.003 Checked By Red Sybil Date 8-25-94

DRAWING #1

$$\text{CROSS SECTIONAL AREA} = .766 \times 2.1 = 1.608 \text{ sq in.}$$

$$\times \quad 2 \text{ SCANS}$$

$$3.217 \text{ sq in.}$$

AREA OF LOSS:

$$\text{AXIAL} - 1.608 \div 3.217 \times 100 = 50\%$$

$$\text{CIRC.} - \text{NO LOSS}$$

DRAWING #2

$$\text{CROSS SECTIONAL AREA} = .766 \times 2.1 = 1.608 \text{ sq in.}$$

$$\times \quad 2 \text{ SCANS}$$

$$3.217 \text{ sq in.}$$

AREA OF LOSS:

$$\text{AXIAL} - \frac{.33 \times .33}{2} + 1.608 = 1.669$$

$$1.669 \div 3.217 \times 100 = 51.88\% - 52\%$$

$$\text{CIRC.} \quad 100\%$$

| | AXIAL (LOSS) | CIRC. | |
|------------|----------------|----------------|-----------------------|
| DRAWING #1 | 50% | 0% | |
| DRAWING #2 | 52% | 100% | 51 |
| | $102\% - 51\%$ | $100\% = 50\%$ | $\frac{50}{2}$ |
| | | | $101 \div 2 = 50.5\%$ |

A 45° L-WAVE WAS USED TO SCAN WELD FROM 1 DIRECTION ONLY. NO SCAN WAS PERFORMED FROM SURFACE 2 (NOZZLE SIDE) DUE TO NOZZLE/WELD CONFIGURATION.

NO OTHER LIMITATIONS

QUALITIES FOR REQUEST FOR RELIEF

AREA OF COVERAGE IS 100% - AREA OF LOSS (50.5%) = 49%

(



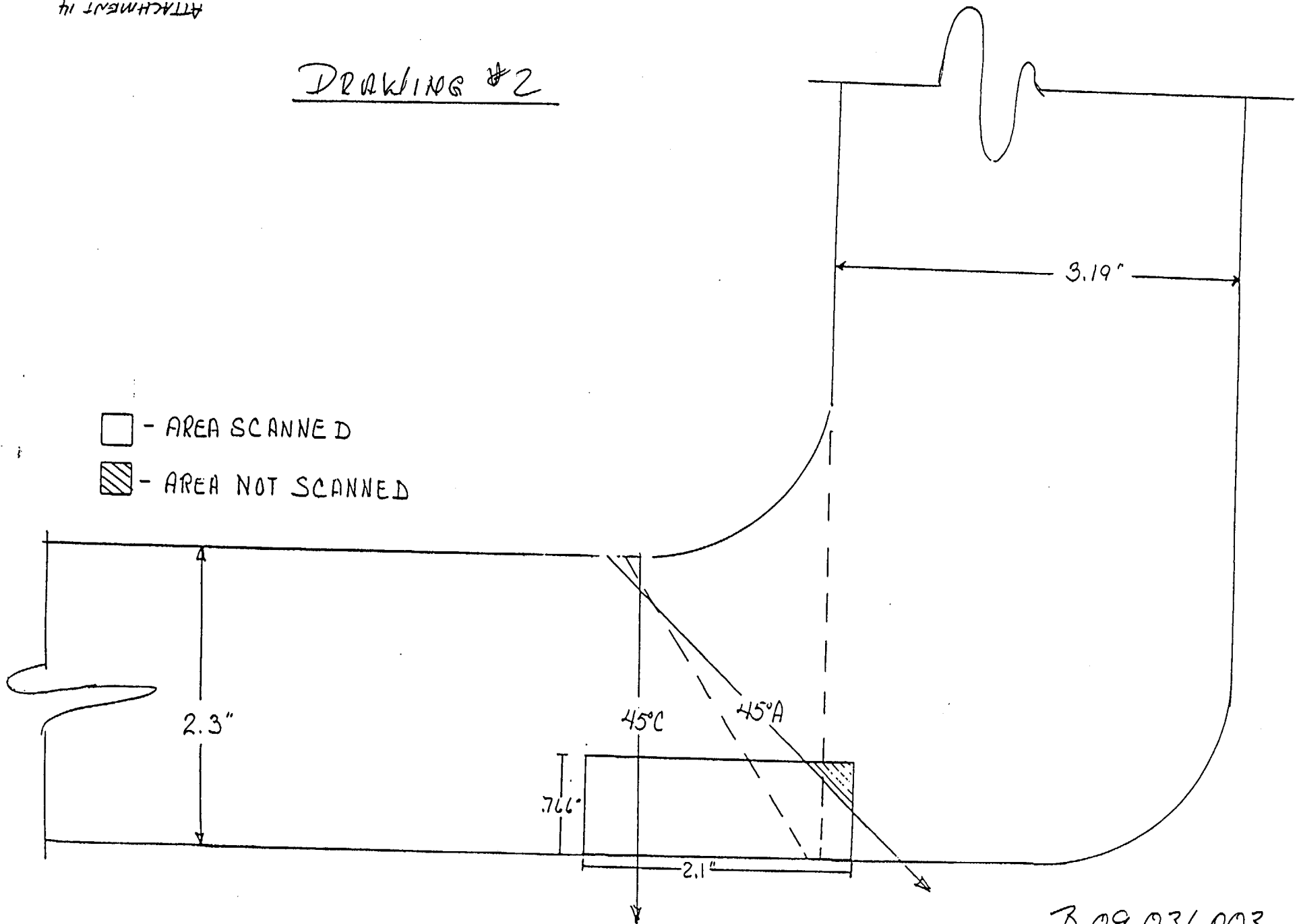
(

7. A DRAIVING

DRAWING #2

□ - AREA SCANNED

▨ - AREA NOT SCANNED



B 09.031.003

DUKE POWER COMPANY

ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1SGA-02-03 Item No: C01.030.001

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☒ cw ☒ ccw
 FROM L 422" to L "7 INCHES FROM WO 0.0" to 8.0" S1
0.0" to 10.0" S2
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other FROM DEG to DEG

Due to Inspection port
 and branch connection.
 (9.0" Area)

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☒ cw ☒ ccw
 FROM L 102" to L 111" INCHES FROM WO 0.0" to 8.0" S1
0.0" to 10.0" S2
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other FROM DEG to DEG

Due to Inspection port
 and branch connection.

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☒ cw ☒ ccw
 FROM L 209" to L 221" INCHES FROM WO 0.0" to 8.0" S1
0.0" to 10.0" S2
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other FROM DEG to DEG

Due to Inspection port
 and branch connection.

☒ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☒ cw ☒ ccw
 FROM L 316" to L 327" INCHES FROM WO 0.0" to 8.0" S1
0.0" to 10.0" S2
 ANGLE: ☒ 0 ☒ 45 ☒ 60 other FROM DEG to DEG

Due to Inspection port
 and branch connection.

Sketch(s) attached
☐ yes ☒ no

Prepared By: Randy Mauldin

Level: II

Date: 3-30-93

Sheet 3 of 5

Reviewed By: Rod Sheffield

Date: 4-1-93

Authorized Inspector: [Signature]

Date: 4-2-93

DUKE POWER COMPANY
Ultrasonic Beam Spread Measurement Sheet

NDE-UT-6

Revision 0

$\frac{1}{4}T$: MP-IN - 1.499 - W-1 - 1.35
 MP-MAX - 2.143 - W-MAX - 2.05
 MP-OUT - 2.530 - W-2 - 2.55
 $\frac{1}{2}T$: MP-IN - 3.474 - W-1 - 3.15
 MP-MAX - 4.196 - W-MAX - 3.85
 MP-OUT - 4.810 - W-2 - 4.50
 $\frac{3}{4}T$: MP-IN - 5.430 - W-1 - 4.85
 MP-MAX - 6.255 - W-MAX - 5.75
 MP-OUT - 7.113 - W-2 - 6.70

20% BEAM SPREAD

Transducer S/N: B07964

Basic Calibration Block ID: 50279

Measured Beam Angle: 61°

Calibration Sheet No: 193028

Examiner:

DJ Moss

Level:

II

Date:

3-30-93

Reviewed By:

Red Haffield

Level:

II

Date:

4-1-93

Authorized Inspector:

R. Klein

Date:

4-2-93

4 of 5

PAGE 4 OF 10

DUKE POWER COMPANY

Ultrasonic Beam Spread Measurement Sheet

NDE-UT-6

Revision 0

$\frac{1}{4}T$ • MP-IN - 1.12 • W-1 - .6
• MP-MAX - 1.45 • W-MAX - 1.0
• MP-OUT - 1.86 • W-2 - 1.65

$\frac{1}{2}T$ • MP-IN - 2.5 • W-1 - 1.65
• MP-MAX - 2.94 • W-MAX - 2.2
• MP-OUT - 3.21 • W-2 - 2.46

$\frac{3}{4}T$ • MP-IN - 3.95 • W-1 - 2.7
• MP-MAX - 4.34 • W-MAX - 3.2
• MP-OUT - 4.59 • W-2 - 3.65

Transducer S/N: 807963

Basic Calibration Block ID: 50279

Measured Beam Angle: 45°

Calibration Sheet No: 193031

Examiner:

Level:

Date:

Reviewed By:

Level:

Date:

Authorized Inspector:

Date:

J. Bebb

II 3-30-93

Rod Hefield




II 4-1-93

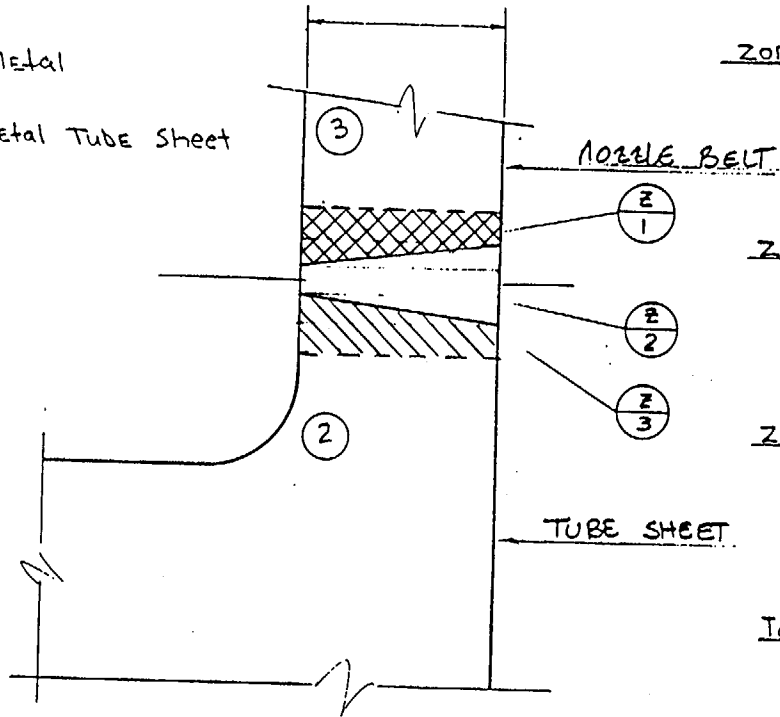
R. E. Green

4-2-93

5 of 5

PAGE 5 of 5

- 
 ZONE 1 BASE METAL NOZZLE BELT

 ZONE 2 WELD METAL

 ZONE 3 BASE METAL TUBE SHEET



EXAM AREA By Zone

Zone 1 AREA

$$.5 \times 3.25 + \frac{3.25 \times .4}{2} = 1.625 + .65 = \underline{2.275 \text{ sq.in}}$$

31.1 % of total AREA.

Zone 2 AREA

$$\frac{3.25 \times .4}{2} + 3.25 \times .45 + \frac{3.25 \times .4}{2} = 2.7625 \text{ sq. in}$$

37.8 % of Total AREA

37.8 % of Total AREA

Zone 3 AREA

$$.5 \times 3.25 + \frac{3.25 \times .4}{2} = 1.625 + .65 = 2.275 \text{ sq in}$$

31.1% of total AREA

Total EYAM AREA = 7.3125 sq. in.

Col. 030.001

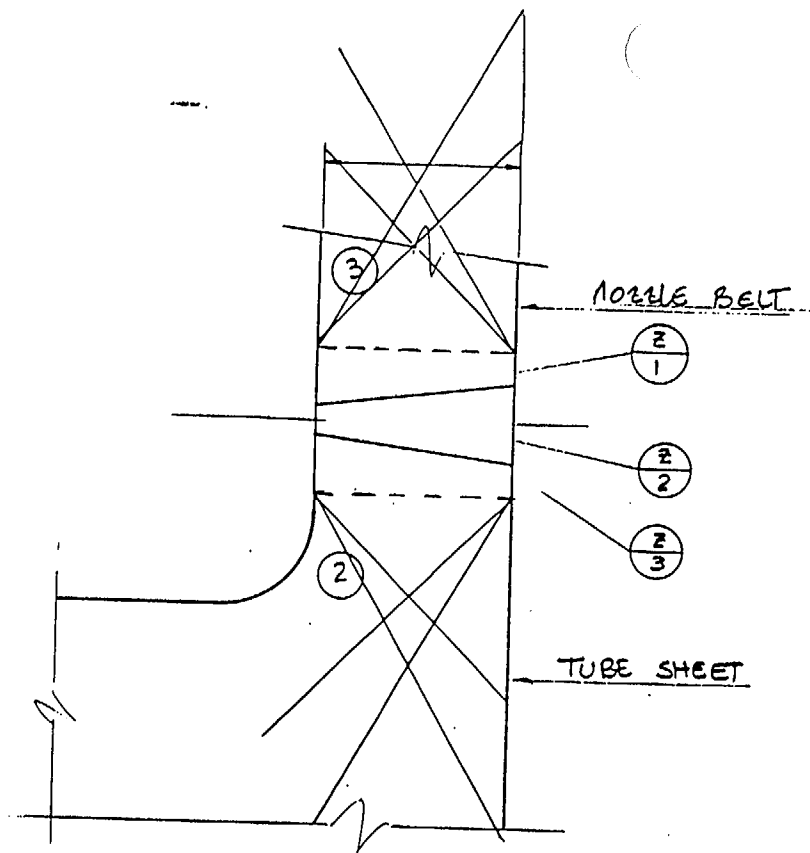
~~COI. OIA. OAI~~

SCALE 1" = 2.0"

DUKE POWER COMPANY

STEAM GENERATOR
NORUE BELT TO TUBE SHEET
pc-3 TO pc-2

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | SCALE 1" = 2.0" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | DUKE POWER COMPANY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | STEAM GENERATOR NOELLE BELT TO TUBE SHEET PC-3 TO PC-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORIG. | | | | | | | | | | | | | | | DESIGNER _____ DATE _____ INSP. _____ DATE _____ DRAWN _____ DATE _____ INSP. _____ DATE _____ CHECKED _____ DATE _____ APPR. _____ DATE _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NO. REVISIONS | | | | | | | | | | | | | | | DWG. NO. | | | | | | | | | | | | | | | REV. | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | DRN DATE CHKD DATE APPR DATE CIVIL MISC. MECH. INSPECTED | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



Inspection Coverage

ZONES 1, 2, 3

100% Coverage

Excluding Insp. Ports

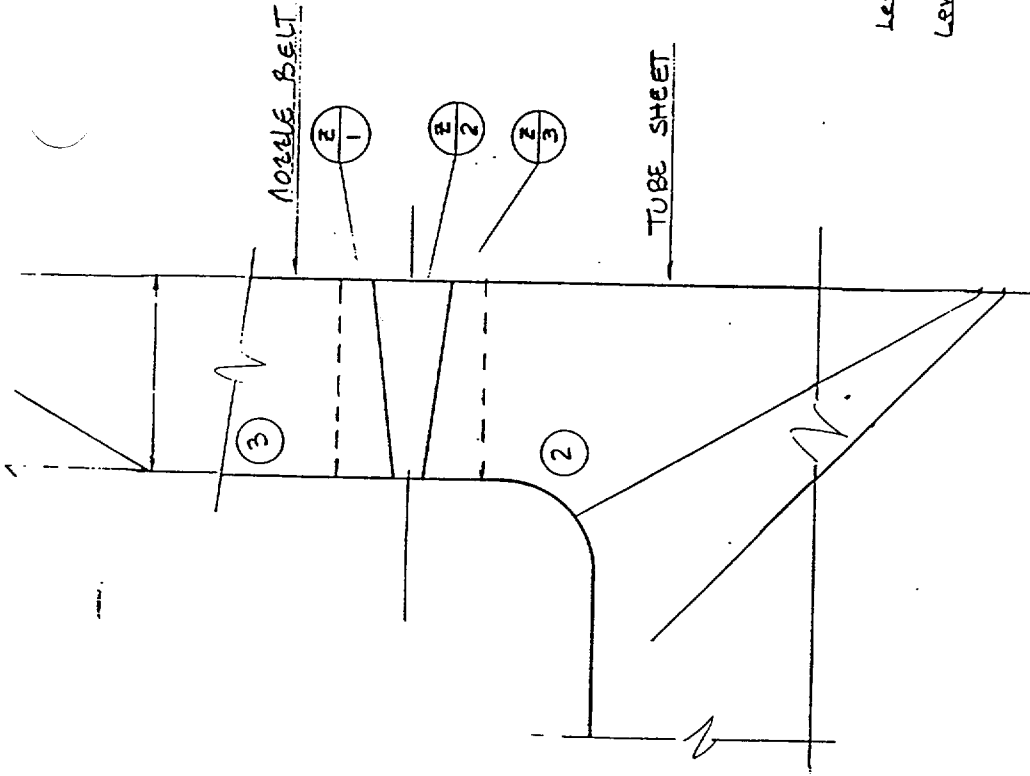
| | |
|-------|-----------|
| AXIAL | 45 1 to 2 |
| | 45 2 to 1 |
| | 60 1 to 2 |
| | 60 2 to 1 |
| CIRC | 45 CW |
| | 45 CCW |
| | 60 CW |
| | 60 CCW |
| 0° | Scan |




COI.030.001

Continued

SCALE 1" = 2.0"

| | | | | | | | | | | | | | | |
|-----|-----------|--|--|--|-----|------|------|------|------|--|------|-----|------|-----------|
| | | | | | | | | | | DUKE POWER COMPANY | | | | |
| | | | | | | | | | | STEAM GENERATOR | | | | |
| | | | | | | | | | | NOZZLE BELT TO TUBE SHEET | | | | |
| | | | | | | | | | | PC-3 TO PC-2 | | | | |
| | | | | | | | | | | DESIGNER _____ DATE _____ INSP. _____ DATE _____ | | | | |
| | | | | | | | | | | CHECKER _____ DATE _____ INSP. _____ DATE _____ | | | | |
| | | | | | | | | | | DWD. NO. _____ REV. _____ | | | | |
| NO. | REVISIONS | | | | DRN | DATE | CHKD | DATE | APPR | DATE | CYCL | ELC | INSP | INSPECTED |



| | |
|--|--------------|
|  | area scanned |
|  | partial scan |
|  | no scan |

Inspection Coverage
Zones 1,2,3
Insp. Ports, Branch Conn.
100% Loss

| | | | | | |
|-----------------|---------|---------|----------|----------|-----------|
| Inspection Port | 36 to 2 | 9 to 11 | 18 to 20 | 27 to 29 | total |
| Length of loss | 18 in. | 14 in. | 12 in. | 14 in. | 58 inches |

Length of loss 58.0
 Length of wind 432
 $\therefore \frac{58}{432} \times 100 = 13.43\% \text{ loss}$

Col. 030.001

~~SECRET~~

SCALE 1" = 2.0"

DUKE POWER COMPANY

[illegible]