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November 15, 2007

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

Subject: Duke Power Company LLC d/b/a Duke Energy  
Carolinas, LLC (Duke)  
Oconee Nuclear Station, Unit 3  
Docket Nos. 50--287  
Third Ten Year Inservice Inspection Interval  
Request for Relief No. 02-001, Revision 1

Pursuant to 10 CFR 50.55a(g)(5)(iii), attached is a Request for Relief from the requirement to examine 100% of the volume specified by the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda (as modified by Code Case N-460). This request is to allow Duke to take credit for limited ultrasonic examinations on a specific Reactor Building penetration pipe to valve weld described in the attached request. During examination of the subject Unit 3 weld, the ultrasonic examination coverage did not meet the 90% examination requirements of Code Case N-460. Achievement of greater than 75% examination coverage for this weld is impractical due to piping/valve geometry, interferences, and existing examination technology. Therefore, Duke requests that the NRC grant relief as authorized under 10 CFR 50.55a(g)(6)(i).

This relief was initially submitted by letter dated March 11, 2002 (ADAMS Accession Number ML020840509). However, the cover letter contained typographical errors and apparently the letter was not entered into the NRC review process pending submittal of a corrected version. The third Inservice Inspection Interval for Oconee Unit 3 terminated January 2, 2005. Despite the elapsed time, Duke is resubmitting the request for NRC review and approval in order to close out the third interval documentation. The attached request was revised during preparation and review for re-submittal and is considered Revision 1. This revision replaces and supersedes the original request.

A047  
NRR

U. S. Nuclear Regulatory Commission  
November 15, 2007  
Page 2

If there are any questions or further information is needed you may contact R. P. Todd at (864) 885-3418.

Very truly yours,



B. H. Hamilton  
Site Vice President

Enclosure

xc w/att: Dr. W. D. Travers  
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U.S. Nuclear Regulatory Commission  
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Atlanta, GA 30303

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Project Directorate II  
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Washington, DC 20555-0001

xc(w/o attch):

D. W. Rich  
Senior NRC Resident Inspector  
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S. E. Jenkins, Section Manager  
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bxc w/att: R. L. Gill, Jr.  
T. J. Coleman  
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G. L. Brouette (ANII)  
J. J. Mc Ardle III  
J. E. Smith  
ISI Relief Request File  
NRIA File/ELL EC05O  
Document Control

**Duke Energy Carolinas**

**Oconee Nuclear Station Unit 3**

**THIRD 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 02-001 Rev. 1**

Duke has determined that conformance with certain ASME Section XI Code requirements is impractical. Therefore, pursuant to 10CFR50.55a(g)(5)(iii), Duke requests relief from applicable portions of the code.

Included in this request is a single Examination Category C-F-2 weld.

The Oconee Unit-3 Inservice Inspection Plan was written to the requirements of the 1989 Edition of ASME Section XI, no addenda.

The exam in this Request for Relief was performed during EOC-19, the last outage in the second period of the third ten-year interval.

Code Case N-460 applies to the examination performed during this outage.

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

A. Pipe to Valve 3PR-2:

| <u>ID Number</u> | <u>Item Number</u> |
|------------------|--------------------|
| 3-20B-21-18-18   | C05.051.046        |

Reference Attachment "A" for a weld iso drawing of the pipe to valve 3PR-2 weld.

Reference Attachment B for a copy of the examination records for the weld addressed in this request.

This weld is part of the Reactor Building Purge System Penetration Piping.

**II. Applicable Code Edition and Addenda**

ASME Section XI Code – 1989 Edition, with no addenda

### III. Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-F-2, Item Number C5.51, Figure IWC-2500-7 (a), Volume Coverage of Examination Volume C-D-E-F.

### IV. Impracticality of Compliance

Pipe to Valve 3PR-2 weld 3-20B-21-18-18 (Item C05.051.046) is limited to 75.00% coverage of the required volume due to the proximity of a penetration. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 56.25% of the weld and base material; 60° shear wave scan perpendicular to the weld (toward the penetration) covered 87.5% for the first leg which included 100% of the inside surface within the area of interest and 100% for the second leg of the weld and base metal in the axial direction. In order to achieve more coverage, the penetration would have to be removed or re-designed to allow scanning from both sides of the weld. That would be impractical. There was one recordable indication found that was determined to be a geometric reflector during the inspection of this weld.

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

### V. Alternate Examinations or Testing

The use of radiography as an alternate volumetric examination of the weld/component referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to limited access for placement of film due to the proximity of the penetration. No additional examinations are planned during the current interval for weld 3-20B-21-18-18.

### VI. Implementation Schedule

This request is for the duration of the third inservice inspection interval, which ended on January 2, 2005.

## **VII. Justification for the Granting of Relief**

The subject weld was examined to the maximum extent practical using ultrasonic techniques qualified in accordance with the requirements of ASME Section XI, Appendix VIII, Supplements 2 and 3 of the 1995 Edition with the 1996 Addenda as administered by the PDI. An ID connected circumferential flaw within the required examination volume would have been detected.

In addition to the volumetric examination with limited coverage, Duke performed a surface examination (code required) on this C5.51 item and achieved 100% coverage. The result from the surface examination was acceptable.

In addition to the C5.51 welds of this relief request, there were five additional C5.51 welds that surface and volumetric examinations were performed on during the outage. All of the surface and volumetric examinations except for one surface examination were acceptable. A surface examination on weld 3MS-20B-B found a reportable indication which was removed by grinding and reexamined and found to be acceptable. Additional surface exams were performed as required by code. 100% coverage was obtained on all five additional C5.51 surface and volumetric examinations. Three of the five additional welds were from the Low Pressure Service Water System, one of the additional welds was from the Feedwater System, and one of the additional welds was from the Main Steam System.

IWC-2500, Table IWC-2500-1, Examination Category C-H System Leakage Tests and VT-2 visual examinations performed once each period provide adequate assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface, and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld it would be detected and proper action taken. Specifically, Appendix J penetration leak rate testing performed during refueling outages provides additional assurance that any leakage would be detected prior to gross failure of the component.

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

PARADISE  
ELLENBURG  
ALM

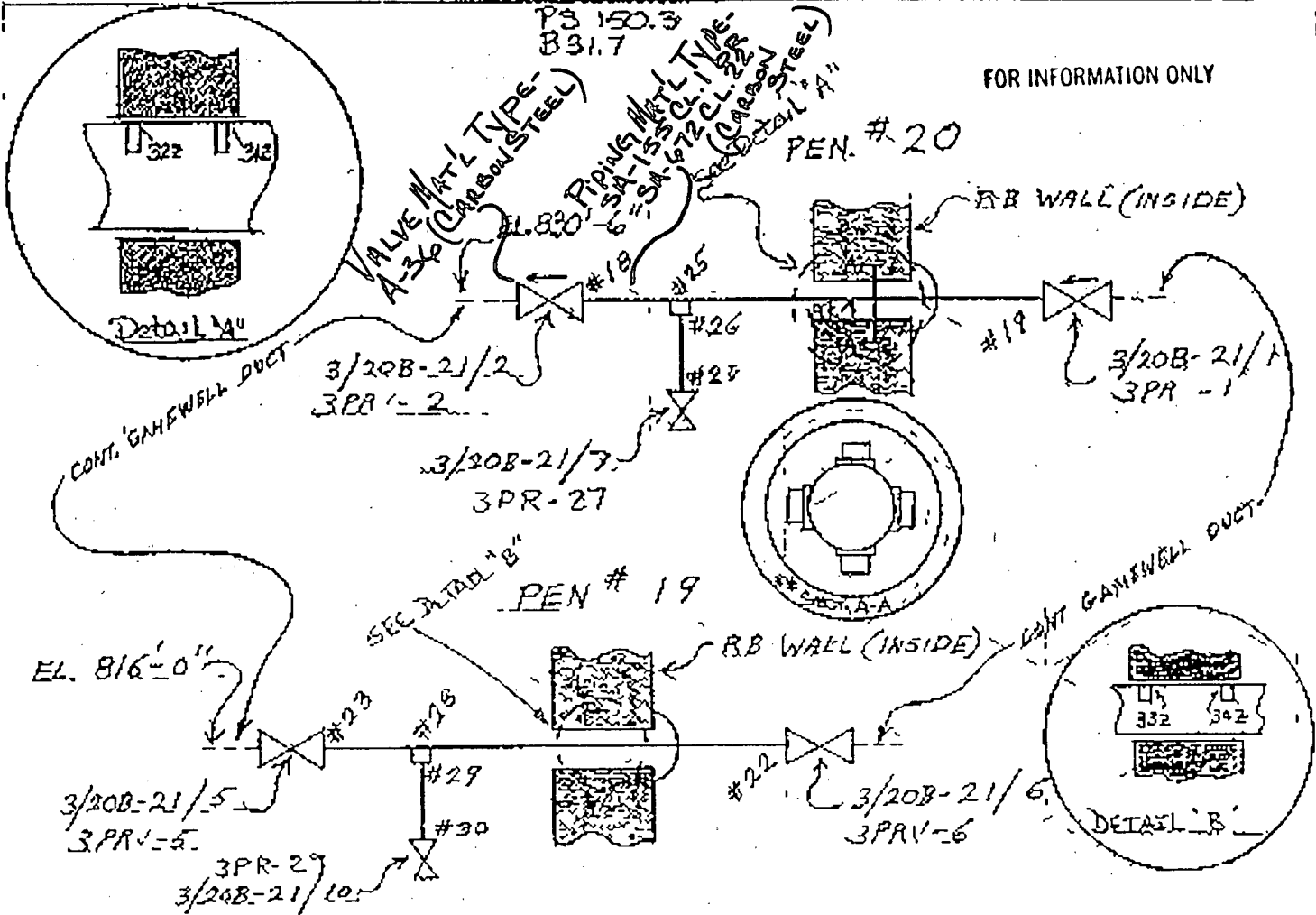
DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT

R.B. WALL PURGE LINE  
PENETRATIONS

ISOMETRIC SKETCH

PROJECT OCONEE SYSTEM 20B-21 SUB SYSTEMS (1) UNIT 3A,B ISO. NO. 18 REV. NO. 3  
CLASS C MATERIAL CFE WELDING PROCEDURE P5/P19 LAST WELD NO. 34 DATE 7-15

Attachment A  
Request for Relief 02-001  
Page 1 of 1



FOR INFORMATION ONLY

\*NOTE: THESE WELDS TRANSFERRED FROM 150.1 FT III (SYS. 20B-20)  
\*\*REF HGR #3-20B-NREA-H3609

ERN:DX0092S8

| REF Dwg NOS  | Dwg | REV | SIZE x WALL THICKNESS | WELD NUMBERS                             | NDT CODE | SC REV | CHANGES VIT - NOS   | ISO KEY NO | CHANGES  |
|--------------|-----|-----|-----------------------|--|----------|--------|---|------------|----------|
|              |     |     |                       |  |          |        |   |            | WELD NOS |
| 2439C        | 1   |     | 48" x 500"            | 18, 19, 22, 23,                          | 87       |        | 12-13 12<br>ADD COLL.   |            |          |
| 2479A        | 2   |     |                       |  |          |        | 19-317, 322, 524, 525<br>26-376, 377, 378, 379<br>332, 342 OF 374, 375<br>40-920, 921, 922, 923 |            |          |
| 2479D        | 2   |     | 1" x 133"             | 25-30,                                   | 04       |        |   |            |          |
| 05D-116A-3.1 |     |     |                       |  |          |        |   |            |          |
| PO-116A-3    |     |     |                       | Attach. Welds: 317, 308, 192, 332<br>342 |          |        |   |            |          |

ALL WELD NUMBERS SHOWN ABOVE ARE PREFIXED BY THE ISO. NO.  
D.L.O.

| DUKE POWER COMPANY                                       |    |                            |                               |                          |                                   |                               |                           |   |                          | Exam Start: 1152          |                          | NDE-UT-3A                 |            |         |  |
|--|----|----------------------------|-------------------------------|--------------------------|-----------------------------------|-------------------------------|---------------------------|---|--------------------------|---------------------------|--------------------------|---------------------------|------------|---------|--|
| ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS |    |                            |                               |                          |                                   |                               |                           |   |                          | Exam Finish: 1244         |                          | Revision 2                |            |         |  |
| Station: Oconee  |    |                            | Unit: 3                       |                          | Component/Weld ID: 3-20B-21-18-18 |                               |                           |   |                          | Date: 10/25/2001          |                          |                           |            |         |  |
| Nominal Material Thickness (in): 0.5                     |    |                            | Weld Length (in.): 151.0"     |                          |                                   | Surface Temperature: 99 Deg F |                           |   |                          |                           |                          |                           |            |         |  |
| Measured Material Thickness (in): 0.542                  |    |                            | Lo: 9.1.1.1                   |                          |                                   | Pyrometer S/N: MCNDE 27217    |                           |   |                          |                           |                          |                           |            |         |  |
| Surface Condition: AS GROUND                             |    |                            | Calibration Sheet No: 0103013 |                          |                                   |                               |                           | Cal Due: 2/14/2002                                      |                          |                           |                          |                           |            |         |  |
| Examiner: Jay A. Eaton <i>[Signature]</i> Level: III     |    |                            |                               |                          |                                   |                               |                           | Configuration: <u>Pipe to Valve (Valve 3PR-2)</u>       |                          |                           |                          |                           |            |         |  |
| Examiner: James L. Panel <i>[Signature]</i> Level: II    |    |                            |                               |                          |                                   |                               |                           | <u>VALVE</u> Flow <u>PIPE</u><br><u>S1</u> to <u>S2</u> |                          |                           |                          |                           |            |         |  |
| Procedure: NDE-640 Rev: 1 FC: *                          |    |                            |                               |                          |                                   |                               |                           |   |                          |                           |                          |                           |            |         |  |
| IND NO.  |    | Ampl<br>≥ rem<br>BW<br>LOB | L1<br>≥ rem<br>BW<br>LOB      | W1<br>≥ rem<br>BW<br>LOB | Mp1<br>≥ rem<br>BW<br>LOB         | W2<br>≥ rem<br>BW<br>LOB      | Mp2<br>≥ rem<br>BW<br>LOB | L2<br>≥ rem<br>BW<br>LOB                                | W1<br>≥ rem<br>BW<br>LOB | Mp1<br>≥ rem<br>BW<br>LOB | W2<br>≥ rem<br>BW<br>LOB | Mp2<br>≥ rem<br>BW<br>LOB | Exam Surf. | Damps / |  |
| NRI  | 0° |                            |                               |                          |                                   |                               |                           |   |                          |                           |                          |                           |            |         |  |

|                                 |  |                  |   |  |  |                       |
|---------------------------------|--|------------------|---|--|--|-----------------------|
| Remarks: * 95-18, 95-19         |  |                  | Limitations: see NDE-UT-4 <input type="checkbox"/> None: <input type="checkbox"/> |  | Sheet <u>1</u> of <u>10</u> <i>[Signature]</i> |                       |
| Reviewed By: <i>[Signature]</i> |  | Level: <u>II</u> | Date: <u>10-25-01</u>   | Authorized Inspector: <i>[Signature]</i> |  | Date: <u>10/30/01</u> |
|                                 |  |                  |   |  | Item No: C05.051.046                           |                       |

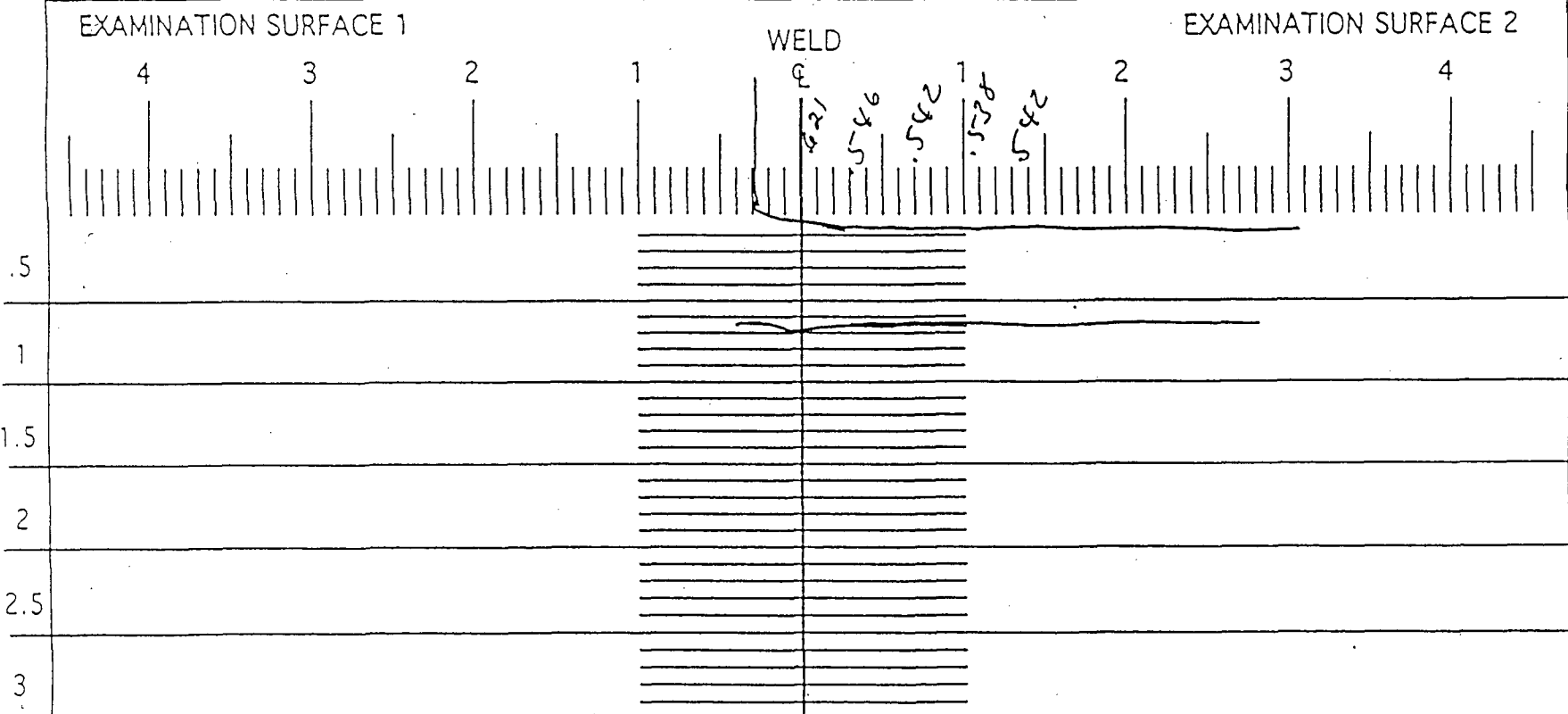
Attachment B  
 Request for Relief 02-001  
 Page 1 of 10



DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

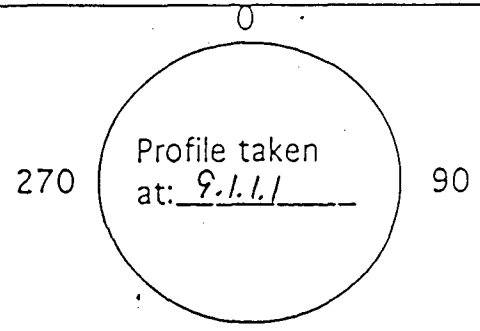


Component ID/Weld No. 3-20B-21-18-18

Remarks:

Examiner: *[Signature]* Level: III Date: 10/25/01  
 Reviewed By: *[Signature]* Level: II Date: 10-25-01  
 Authorized Inspector: *[Signature]* Date: 10/30/01

Item No: C05.051.046



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Attachment B  
Request for Relief 02-00  
Page 7 of 10

**DUKE POWER COMPANY**  
**ULTRASONIC INDICATION RECORD FOR PIPING**

FORM NDE-UT-10

Revision 0

Station: Oconee Unit: 3 Component/Weld ID: 3-20B-21-18-18 Date: 10/25/2001

Surface Condition: AS GROUND Item No: C05.051.046

Examiner: Jay A. Eaton *[Signature]* Level: III Procedure: NDE-600 Rev: 14 FC: N/A

Examiner: James L. Panel *[Signature]* Level: II Lo: 9.1.1.1 Configuration: Pipe to Valve (Valve 3PR-2)

Calibration Sheet No: 0103012 S2 to S1 Scan Surface: OD

| IND # | <u>4</u> | % FSH | Mp Max | W Max | L Max | L1<br>20 % FSH | L2<br>20 % FSH | Beam Dir. | Exam Surf. | Scan  | Damps | Remarks |
|-------|----------|-------|--------|-------|-------|----------------|----------------|-----------|------------|-------|-------|---------|
| 1     | 60       | 60    | 1.3    | 1.0"  | 6.0"  | 360°           | INT.IND        | 1         | 2          | AXIAL | NO    |         |

Reviewed By: Gary Moss *[Signature]* Level: D Date: 10-25-01 Authorized Inspector: [Signature] Date: 10/30/01 Sheet 3 of 10 ~~6800~~

Attachment B  
 Request for Relief 02-001  
 Page 3 of 10

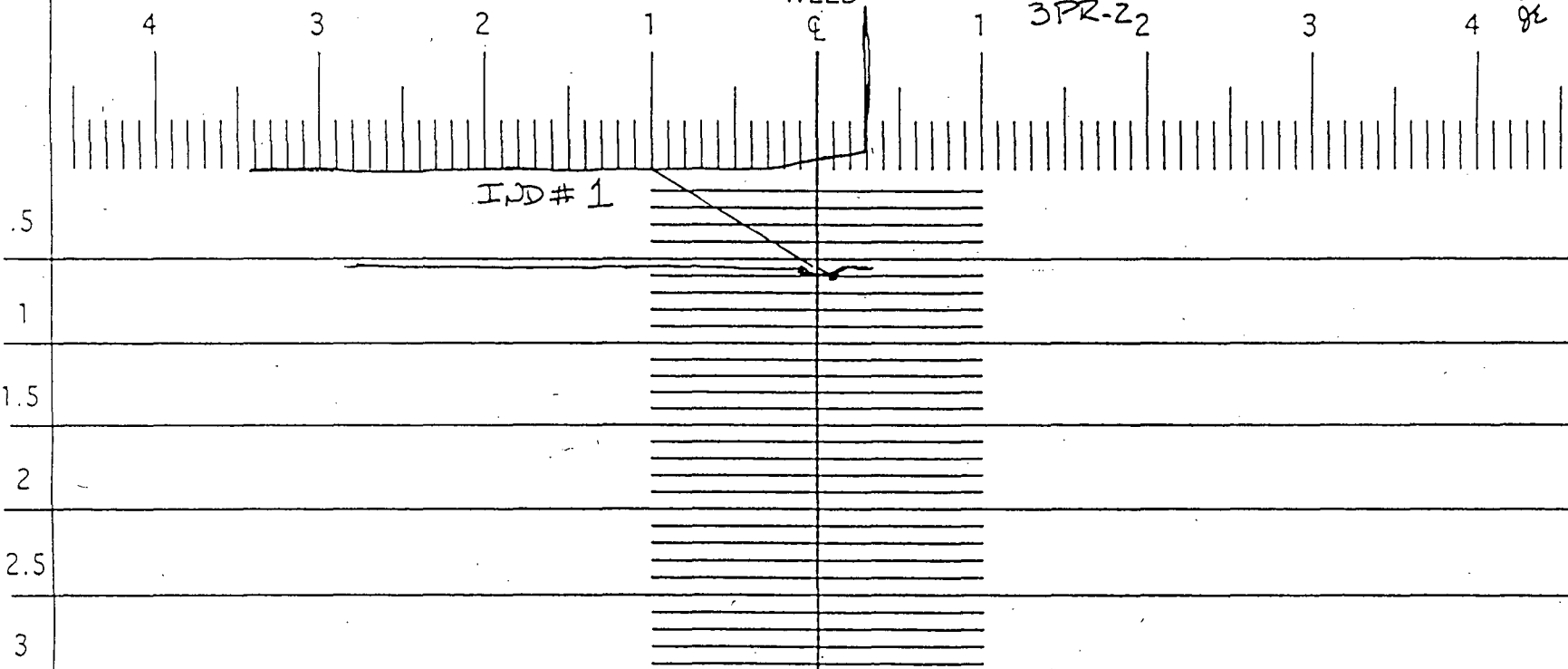
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

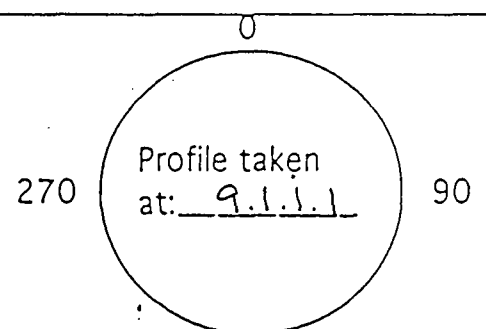
EXAMINATION SURFACE X - PIPE

VALVE - EXAMINATION SURFACE Z



Component ID/Weld No. 3-20B-21-18-18

Remarks:



Examiner: *[Signature]* Item No: COS.051.046  
 Reviewed By: *[Signature]* Level: III Date: 10/25/01  
 Authorized Inspector: *[Signature]* Level: II Date: 10-25-01  
 Date: 10/30/01

180 Sheet 4 of 6

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 3-20B-21-18-18

Item No: C05.051.046

Remarks:

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

DUE TO VALVE CONFIGURATION

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

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

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

Prepared By: [Signature]                      Level:   III                        Date:   10/25/01                        Sketch(s) attached  yes    no                      Sheet   5   of   10  

Reviewed By:   Gary Moss                        Date:   10-25-01                        Authorized Inspector: [Signature]                      Date:   10/25/01  

Attachment B  
 Request for Relief 02-001  
 Page 5 of 10

DUKE POWER COMPANY

Form NDE-UT-8

ULTRASONIC INDICATION RESOLUTION SHEET

Revision 1

Acceptance Standard:

INDICATION #1 WAS DETERMINED TO BE A GEOMETRIC REFLECTOR DUE TO I.D. WELD ROOT GEOMETRY. THIS WAS CONFIRMED BY 1. THE SIGNAL WOULD NOT HOLD UP TO SKEWING 2. THE 70° SHEAR WAVE RESPONSE WAS 10% FSH VERSUS 60% FSH WITH THE 60° SHEAR WAVE 3. PLOTTING OF THE INDICATION.

Item No: C05.051.046

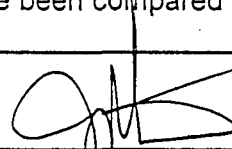
Acceptable Indications: #1

Rejectable Indications: NONE

These indications have been compared with previous ultrasonic data  Yes  No previous data available

Examiner:

Jay A. Eaton



Level:

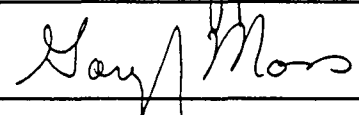
III

Date:

10/25/2001

Sheet 6 of 10  
622m

Reviewer:



Level:

B

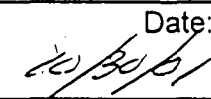
Date:

10-25-01

Authorized Inspector:



Date:



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

**Examination Volume/Area Defined**

Base Metal    
  Weld    
  Near Surface    
  Bolting    
  Inner Radius

| Area Calculation         | Volume Calculation                   |
|--------------------------|--------------------------------------|
| SEE DRAWINGS 0.16 SQ.IN. | 0.16 SQ.IN. X 151 IN. = 24.16 CU.IN. |

**Coverage Calculations**

| Scan # | Angle | Beam Direction | Area Examined (sq.in.) | Length Examined (in.) | Volume Examined (cu.in.) | Volume Required (cu.in.) | Percent Coverage |
|--------|-------|----------------|------------------------|-----------------------|--------------------------|--------------------------|------------------|
| 1      | 60    | 1              | .14                    | 151                   | 21.14                    | 24.16                    |                  |
| 2      | 60    | 2              | .16                    | 151                   | 24.16                    | 24.16                    |                  |
| 3      | 45    | 3              | .09                    | 151                   | 13.59                    | 24.16                    |                  |
| 4      | 45    | 4              | .09                    | 151                   | 13.59                    | 24.16                    | 75.0             |

*Original*

|                                  |   |
|----------------------------------|---|
| Initial <input type="checkbox"/> | Final <input checked="" type="checkbox"/> |
| ANII <i>W.F.H.</i>               | DATE 10/30/11                             |
| HSBI & I Co.                     |   |

*Resizer [Signature] 1/28/02*

|  |                              |
|--|------------------------------|
| Item No: C05.051.046                       |                              |
| Prepared By: <i>[Signature]</i>            | Level: III     Date: 1/22/02 |
| Reviewed By: <i>James J. McQuillen III</i> | Level: III     Date: 1-22-02 |

*CPB 8/14/07     DKZ III 8/13/07*

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

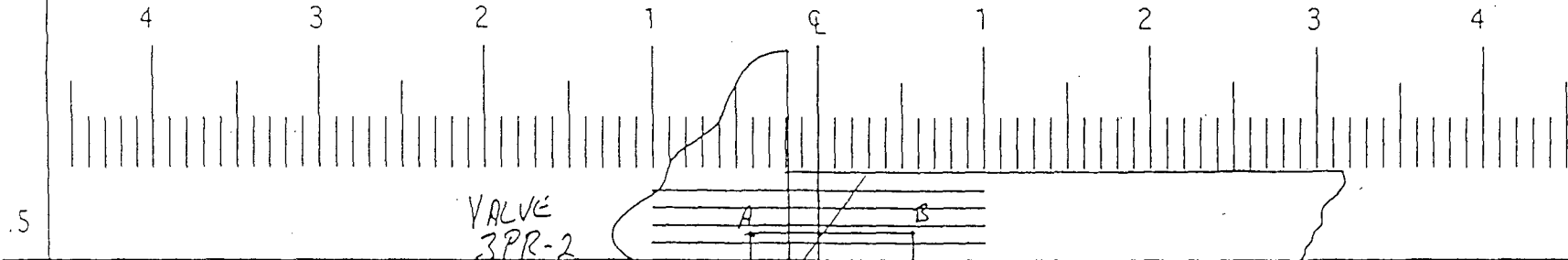
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



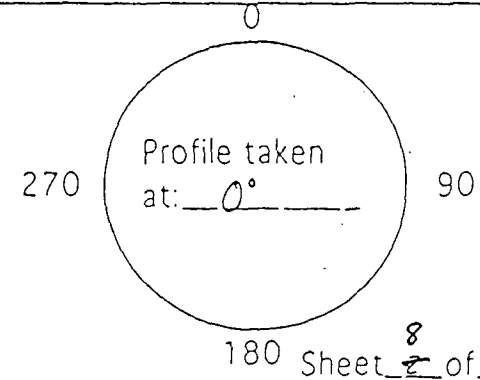
|     |   |  |
|-----|---|--|
| 1   | TOTAL AREA of EXAM  |  |
| 1.5 | $ABCD = .17 \text{ in.} \times .95 \text{ in.} = .1615 \text{ sq. in.}$ |  |
| 2   |   |  |
| 2.5 |   |  |
| 3   |   |  |

Component ID/Weld No. 3-20B-21-18-18

Remarks:

Examiner: [Signature] Level: III Date: 10/25/01  
 Reviewed By: [Signature] Level: II Date: 10-25-01  
 Authorized Inspector: [Signature] Date: 10-25-01

Item No: 205.051.046



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DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

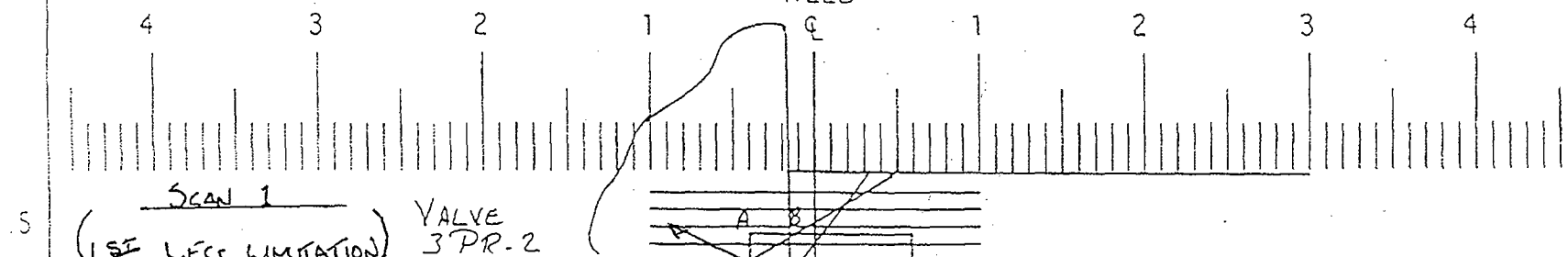
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



1 60° SWEEP W/AVE COVERAGE

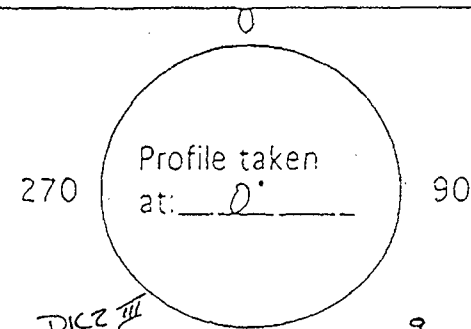
1.5 (LOSS) ABC =  $\frac{.17 \times .25}{2} = .025$

2 (TOTAL AREA) .16 - (LOSS) .02 = .14 COVERAGE

|     |  |
|-----|--|
| 2.5 |  |
| 3   |  |

Component ID/Weld No. 3-20B-21-18-18

Remarks:



Examiner: [Signature]  
Reviewed By: [Signature]  
Authorized Inspector: [Signature]

Item No: COS.051.046  
Level: III Date: 10/25/01  
Level: II Date: 10-28-01  
Date: 10/21/07

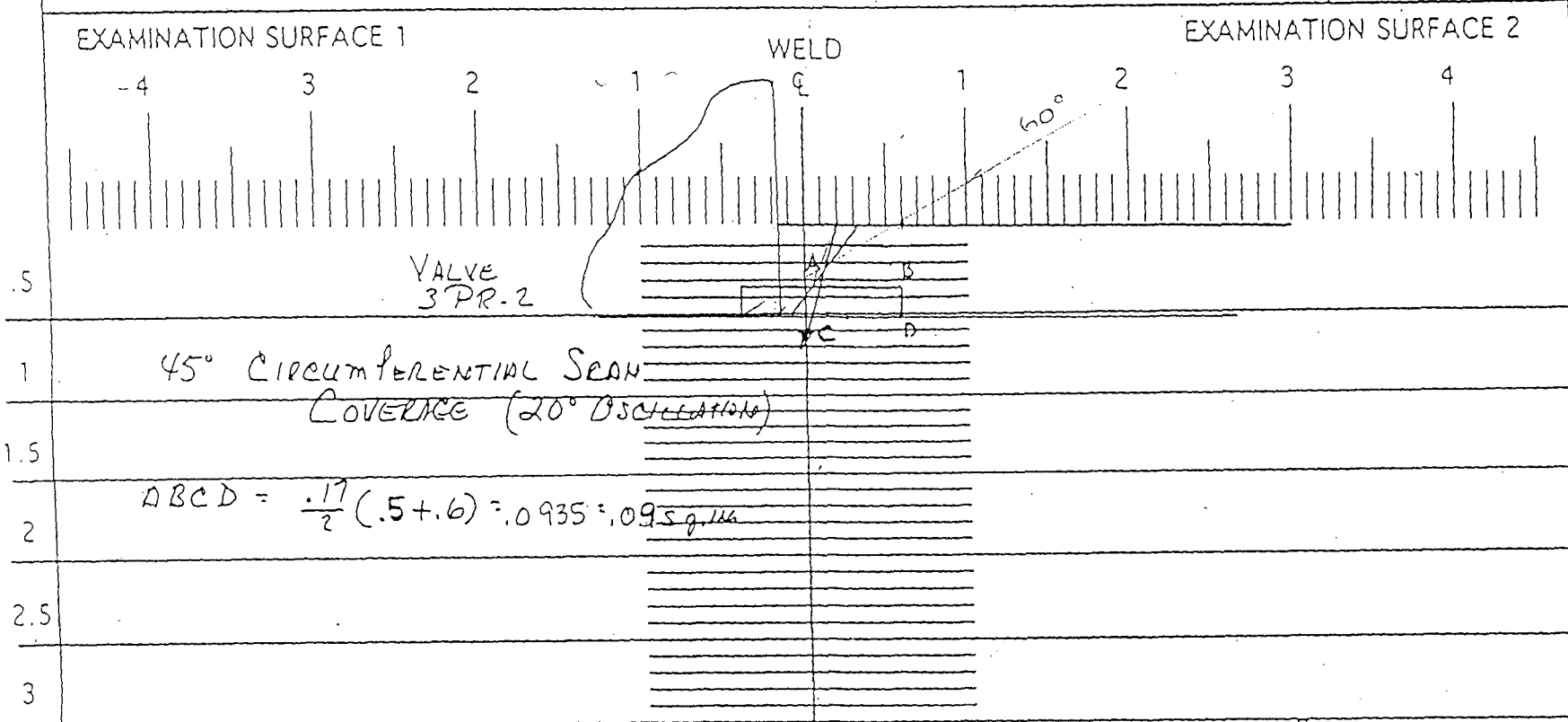
DKZ III 8/13/07 180 Sheet 3 of 4



DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



45° CIRCUMFERENTIAL SCAN  
COVERAGE (20° OSCILLATION)

$$ABCD = \frac{.17}{2} (.5 + .6) = .0935 = .095 \text{ sq. in.}$$

Component ID/Weld No. 3-20B-21-18-18

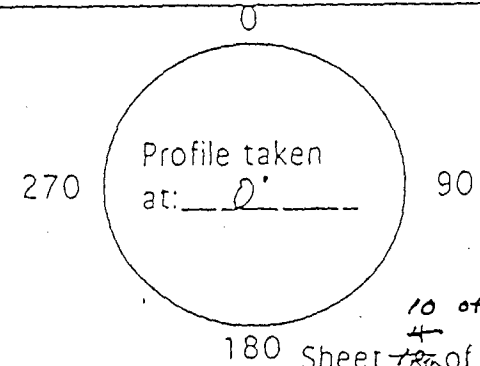
Remarks:

Item No: COS.051.046

Examiner: [Signature] Level: III Date: 1/22/02

Reviewed By: [Signature] Level: II Date: 1-22-02

Authorized Inspector: [Signature] Date: 1/28/02



10 of 10  
4  
180 Sheet 18 of 10

Form used 10/01