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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PHASED ARRAY ULTRASONIC TESTING REPORT** | | | | | | | | | | | | | | | | |
| **JOB DETAILS** | | | | | | | | | | | | | | | | |
| Client: | | **NCOC N.V.** | | Project: | **ESKENE WEST** | | | | | | Work Location: | | | | **Gas 2 Tranch-2** | |
| **JOB DESCRIPTION** | | | | | | | | | | | | | | | | |
| Brief Description of Job: | | | | **Encoded Thickness Measurement Survey of 28” Elbow** | | | | | | | | | | | | |
| Line No.: | | | | **A1-3002-RG-041-28”-C11-HC** | | | | Location: | | | | **Gas 2 Tranch-2 Unit 300** | | | | |
| Material: | | | | **A420 Gr.WPL6** | | | | Surface Condition: | | | | **Coated** | | | | |
| Nominal thickness | | | | **32,62 mm** | | | | Diameter | | | | **28 inch** | | | | |
| Part temperature | | | | **50°C** | | | |  | | | |  | | | | |
| **INSPECTION PROCEDURE** | | | | | | | | | | | | | | | | |
| Procedure No: | | | **QP-11-PAUT-CM-Q01 REV 03** | | | In accordance with: | | | **ASME sec V** | | | | In accordance with: | | | **Client Specification** |
| **INSPECTION EQUIPMENT** | | | | | | | | | | | | | | | | |
| S. No | Equipment/  Material Name | | | Manufacturer | | | Serial No | | | Calibration certificate No | | | | Calibration Expiry date | | |
|  | OmniScan MX2 | | | Olympus | | | 103488 | | | BK-01-2826 | | | | 26.12.2020 | | |
|  | Step wedge calibration block 5-10-20-40 mm | | | Fizpribor | | | 3255-20 | | | C285-20 | | | | 09.06.2021 | | |

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| **EQIPMENT PARAMETERS** | | | | | | **CALIBRATION BLOCK DETAILS** | |
| Mode | **Tx/Rx** | Filter | **BP 8 MHz** | Points quantity | **640** | Cal block | **Step wedge** |
| Frequency | **7.5 MHz** | Rectifier | **FW** | No of elements | **64** | Material | **CS** |
| Energy | **40 V** | Video filter | **On** | Element pitch | **1 mm** | Range | **10.0-40.0 mm** |
| Pulse width | **100 ns** | Averaging | **1** | Ref sensitivity | **10 dB** | Temperature | **29°C** |
| PRF | **Auto** | Focus depth | **Unfocused** | Scan sensitivity | **+0 dB** | Correction | **n/a** |
| Probe | **Olympus Hydroform** | Wedge | **n/a** | Couplant | **Water** | Accuracy | **±0.1 mm** |

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| **SCAN PLAN** | | | | | | | | |
| Test Ref | Scan type | Beam type | Index offset | Start element | Active elements | First Element | Last Element | Element Step |
|  | Linear | Compression | 30.5 | 1 | 64 | 1 | 64 | 1 |

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| --- | --- | --- | --- |
| **CALIBRATION DETAILS** | | | |
| Calibration on (10.0-20.0-40.0) mm step wedge block:  O:\Production Operations\Operations Technical\PEI\12 NDT\Andrei Shafar\Reports\PAUT\A1-3001-RG-041\Calibration.JPG | | | |
| **DETAILS AND RESULTS** | | | |
| Phased Array inspection was carried out on **A1-3002-RG-041-28”-C11-HC** **elbow** for the area of 3-6-9 0’çlock positions with respect to flow. All areas were scanned in increments of 50mm giving an overlap of approx. 11mm and Varied in length and shape to maximise the area covered around the restrictions. Datum points were clearly marked with permanent marker to ensure accurate repeatability. The surface condition was good with Minimal loss of Data due to paint peel off on the surface.  Data collected with (0-350) mm on X-axis, (0-2000) mm on Y-axis. Datum 0 in scan axis started from long seam at 6 O’clock position.950-1050 was not scanned due to the obstruction of UT MAT. | | | |
| **INSPECTION DRAWING** | | | |
|  | | | |
| **INSPECTION PHOTO** | | | |
| O:\Production Operations\Operations Technical\PEI\12 NDT\Andrei Shafar\Reports\PAUT\A1-3001-RG-041\IMG_20200815_133710.jpg | | O:\Production Operations\Operations Technical\PEI\12 NDT\Andrei Shafar\Reports\PAUT\A1-3001-RG-041\IMG_20200815_133729.jpg | |
| **DETAILS AND RESULTS** | | | |
| **A1-3002-RG-041-28”-C11-HC** | | | |
| O:\Production Operations\Operations Technical\PEI\12 NDT\Andrei Shafar\Reports\PAUT\A1-3002-RG-041\Pictures\PIC.JPG | | Data collected with (0-350) mm on X-axis, (0-2000) mm on Y-axis. Datum 0 in scan axis started from long seam at 6 O’clock position. 950-1050 was not scanned due to the obstruction of UT MAT. | |
| O:\Production Operations\Operations Technical\PEI\12 NDT\Andrei Shafar\Reports\PAUT\A1-3002-RG-041\Pictures\left top 1.JPG | | | |
| The minimum thickness of the A1-3002-RG-041-28”-C11-HC - Elbow | | | |
| **FULL SCAN VIEW OF A1-3002-RG-041-28”-C11-HC - Elbow** | | | |
| **O:\Production Operations\Operations Technical\PEI\12 NDT\Andrei Shafar\Reports\PAUT\A1-3002-RG-041\Pictures\FULL VIEW.JPG** | | | |
| **RESULTS (A1-3002-RG-041-28”-C11-HC – Elbow)** | | | |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | S. No | Inspection Date | Min  (mm) | X  (mm) | Y  (mm) | Average (mm) | | 1 | 04-09-2017 | 34.9\* | 160-275 | 760-950 | 36.05 | | 2 | 08-12-2017 | 34.54\* | 160-320 | 760-950 | 35.31 | | 3 | 17-03-2018 | 34.43\* | 160-320 | 760-950 | 35.31 | | 4 | 26-09-2018 | 34.35 | 160-320 | 760-950 | 35.30 | | 5 | 16-07-2019 | 34.35 | 160-340 | 760-950 | 35.30 | | 6 | 15-08-2020 | 34.36 | 160-340 | 760-950 | 35.30 |   \*Minimum thickness observed at random spots in the mentioned area | | | |
| Examined by  PAUT Level II cert. No 1A 002/18 | Name: Shafar Andrei  expiry date: 30.11.2022 | Signature: .......................... | Date: 17 August 2020 |
| Approved by  PAUT Level II cert. No 1A 164/16 | Name: Dzmitry Kuryanau  expiry date: 28.02.2021 | Signature: .......................... | Date: 17 August 2020 |
| Client Representative: | ………………………….…. | Signature: ..................... | Date: .................. |