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| **PHASED ARRAY ULTRASONIC TESTING REPORT** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **JOB DETAILS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Client: | | | **NCOC N.V.** | | | | Project: | | | | **ESKENE WEST** | | | | | | | | | | | Work Location: | | | | **Oil Tr-3** | | | |
| **JOB DESCRIPTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brief Description of Job: | | | | | | | **Encoded Thickness Measurement Survey of 8” Line.** | | | | | | | | | | | | | | | | | | | | | | |
| Line No.: | | | | | | | **A1-2103-RO-053-8”-A13** | | | | | | | | Location: | | | | | | | **Unit 210** | | | | | | | |
| Material: | | | | | | | **A333 Gr.6** | | | | | | | | Surface Condition: | | | | | | | **Painted** | | | | | | | |
| Nominal thickness | | | | | | | **8.18 mm** | | | | | | | | Diameter | | | | | | | **8 inches** | | | | | | | |
| Part temperature | | | | | | | **20° C** | | | | | | | |  | | | | | | |  | | | | | | | |
| **INSPECTION PROCEDURE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Procedure No: | | | | | **QP-11-PAUT-CM-Q01 REV 01** | | | | | | | 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 | | | | | | Olympus | | | | | | 145414 | | | | | | - | | | | | | - | | | | |
| **EQIPMENT PARAMETERS** | | | | | | | | | | | | | | | | | | | | | | | **CALIBRATION BLOCK DETAILS** | | | | | | |
| Mode | | | | **Tx/Rx** | | | | Filter | **None** | | | | | | | 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 | | | | **(6.25-25) mm** | | |
| Pulse width | | | | **100 ns** | | | | Averaging | **1** | | | | | | | Ref sensitivity | | | | **8 dB** | | | Temperature | | | | **20 °C** | | |
| PRF | | | | **auto** | | | | Velocity | **5890 m/s** | | | | | | | Scan sensitivity | | | | **+4 dB** | | |
| Probe | | | | **Olympus Hydroform** | | | | Wedge | **n/a** | | | | | | | Couplant | | | | **Water** | | | Accuracy | | | | **±0.1 mm** | | |
| **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 (6.25-12.5-18.75-25) mm step wedge block:    18.83  25.01  6.34  12.58 |

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| **DETAILS AND RESULTS** |
| Phased Array inspection was carried out on 8’’ line **A1-2103-RO-053-8”-A13**. The scanning areas are mentioned below for each location. All areas were scanned in increments of 50 mm giving an overlap of approx. 11 mm and varied in length and shape to maximise the area covered around the restrictions. The datum points are shown in schemes for clarity. These areas 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. |
| **A1-2103-RO-053-8”-A13**  **KE01-A1-210-PZ-P-D1-2886-001** |

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| **DETAILS AND RESULTS** | | | | | | | | | | | | | |
| **Location -13 (CML- 13)** | | | | | | | | | | | | | |
| C:\Users\NK11016187\AppData\Local\Microsoft\Windows\INetCache\Content.Word\IMG_20200114_101938.jpg  X  Y  0 | | | | | | Data collected with (0-720) on X-axis, (0-350 mm) on Y-axis. Datum point is situated on 20 mm from Circumferential weld and scanned in clockwise direction related to flow. | | | | | | | |
| C:\Users\NK11016187\Desktop\CML_13-full.JPG | | | | | | | | | | | | | |
| The minimum thickness of the location -13 | | | | | | | | | | | | | |
| C:\Users\NK11016187\Desktop\CML_13-C.JPG  ***X axis***  ***Y axis*** | | | | | | | | | | | | | |
| Full scan view with the minimum thickness area of the location -13 | | | | | | | | | | | | | |
| **DETAILS AND RESULTS** | | | | | | | | | | | | | |
| Line number | Location number | Description | Ø, inch | Nominal  thickness, mm1 | Date | | Minimum thickness, mm | Maximum thickness, mm | Area of maximum thickness loss, mm | | | | Average thickness, mm |
| Start X | End X | Start Y | End Y |
| **A1-2103-RO-0653-8-A13** | Loc-13  (CML13) | PIPE | 8” | 8.18 | 14 Jan 2020 | | 8.19 | 10.84 | 400 | 500 | 250 | 350 | 9.51 |

*Notes:*

1. *All measurements include coating*

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| Examined by  UT Level III cer. No 309566 | Pragada Santhosh Kumar  exp date: 13.06.2022 | Signature: .......................... | Date: 14 Jan 2020 |
| Approved by  UT Level III cert. No 2B189/16  PA-UT Level II cert. No. 1A 110/16 | Name: Klindukhou Viachaslau expiry date: 31.05.2021  expiry date: 31.12.2020 | Signature: ........................... | Date: 14 Jan 2020 |
| Client Representative: | ………………………….…. | Signature: ......................... | Date: .................. |