|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PHASED ARRAY ULTRASONIC TESTING REPORT** | | | | | | | | | | | | | | | |
| **JOB DETAILS** | | | | | | | | | | | | | | | |
| Client: | | **NCOC N.V.** | | Project: | **ESKENE WEST** | | | | | | Work Location: | | | **Sulphur CLPW-20** | |
| **JOB DESCRIPTION** | | | | | | | | | | | | | | | |
| Brief Description of Job: | | | | **Encoded Thickness Measurement Survey of 30" (A1-3311-GA-003-30”-A17-HC)** | | | | | | | | | | | |
| Line No.: | | | | **A1-3311-GA-003-30”-A17-HC** | | | | Location: | | | **Unit 331** | | | | |
| Material: | | | | **Carbon steel – A333 Gr.6** | | | | Surface Condition: | | | **Painted** | | | | |
| Nominal thickness | | | | **15.88 mm (A17)** | | | | Diameter | | | **30 inches** | | | | |
| Part temperature | | | | **15 °C** | | | |  | | |  | | | | |
| **INSPECTION PROCEDURE** | | | | | | | | | | | | | | | |
| Procedure No: | | | **QP-11-PAUT-CM-Q01 REV 02** | | | 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 | | | 103704 | | | BK-01-1672 | | | 12.09.2019 | | |
|  | 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 | **+12 dB** | * Temperature | **15 °C** |
| PRF | **auto** | Focus depth | **20 mm** | Scan sensitivity | **0 dB** | Correction | **n/a** |
| 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 |

|  |
| --- |
| **CALIBRATION DETAILS** |
| Calibration on (6,25-12,5-18,75-25) mm step wedge block:    18,68 mm  24,95 mm  6,29 mm  12,49 mm |

|  |
| --- |
| Phased Array inspection was carried out on 30 inch **A1-3311-GA-003-30”-A17-HC .**The scanning areas are mentioned below. 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 photos 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. |
| **A1-3311-GA-003-30”-A17-HC** |
|  |

|  |  |
| --- | --- |
| **DETAILS AND RESULTS** | |
| **Location A1-3311-GA-003-30”-A17-HC (0-1500)-WEST-CML-01** | |
|  | Data collected with (0-300) mm on X-axis, (0-1500) mm on Y-axis. Datum 0 mm in scan axis started at 12 o’clock position and scanned in contraclockwise direction related to flow. |
|  | |
| The minimum thickness of the Location A1-3311-GA-003-30”-A17-HC(0-1500)-WEST | |
| ***X axis***  ***Y axis*** | |
| Full scan view with the minimum thickness area of the location A1-3311-GA-003-30”-A17-HC(0-1500)-WEST | |

|  |  |
| --- | --- |
| **DETAILS AND RESULTS** | |
| **Location A1-3311-GA-003-30”-A17-HC (1500-2300)-WEST- CML-01** | |
|  | Data collected with (0-1000) mm on X-axis, (400-800) mm on Y-axis. Datum 0 (400) mm in scan axis started at 12 o’clock position and scanned in contraclockwise direction related to flow. |
|  | |
| The minimum thickness of the location A1-3311-GA-003-30”-A17-HC(1500-2300)-WEST | |
| ***Y axis***  ***X axis*** | |
| Full scan view with the minimum thickness area of the location A1-3311-GA-003-30”-A17-HC(1500-2300)-WEST | |

|  |  |
| --- | --- |
| **DETAILS AND RESULTS** | |
| **Location A1-3311-GA-003-30”-A17-HC (0-1500)-EAST- CML-01** | |
|  | Data collected with (0-1000) mm on X-axis, (400-800) mm on Y-axis. Datum 0 (400) mm in scan axis started at 12 o’clock position and scanned in contraclockwise direction related to flow. |
|  | |
| The minimum thickness of the location A1-3311-GA-003-30”-A17-HC(0-1500)-EAST | |
| ***Y axis***  ***X axis*** | |
| Full scan view with the minimum thickness area of the location A1-3311-GA-003-30”-A17-HC(0-1500)-EAST | |
| **DETAILS AND RESULTS** | |
| **Location A1-3311-GA-003-30”-A17-HC (1500-2300)-EAST- CML-01** | |
|  | Data collected with (0-1000) mm on X-axis, (400-800) mm on Y-axis. Datum 0 (400) mm in scan axis started at 12 o’clock position and scanned in contraclockwise direction related to flow. |
|  | |
| The minimum thickness of the location A1-3311-GA-003-30”-A17-HC(1500-2300)-EAST | |
| ***Y axis***  ***X axis*** | |
| Full scan view with the minimum thickness area of the location A1-3311-GA-003-30”-A17-HC(1500-2300)-EAST | |

**A1-3311-GA-003-30”-A17-HC**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tag number | Description | Ø, inch | Nominal thickness, mm | Location number | Date | Minimum thickness, mm | Maximum thickness, mm | Area of maximum thickness lose | | | | Average thickness, mm |
| Start X | End X | Start Y | End Y |
| **A1-3311-GA-003-30”-A17-HC** | Elbow | 30 | 15.88 mm (A17) | CML-1  (0-1500) WEST | 16.Mar.2019 | 15.76 | 17.11 | 240 | 270 | 300 | 1500 | 16.43 |
| CML-1  (1500-2300) WEST | 16.Mar.2019 | 15.76 | 17.35 | 210 | 250 | 1500 | 2200 | 16.55 |
| Elbow | 30 | 15.88 mm (A17) | CML-1  (0-1500) EAST | 16.Mar.2019 | 15.64 | 16.90 | 180 | 210 | 950 | 1050 | 16.27 |
| CML-1  (1500-2300) EAST | 16.Mar.2019 | 15.67 | 17.14 | 210 | 250 | 1920 | 2050 | 16.40 |

|  |  |  |  |
| --- | --- | --- | --- |
| Examined by  UT Level III cert. No 300400  PA-UT Level II cert. No. 319659 | Name: Kishore kumar.P  expiry date: 07.07.2023  expiry date: 17.04.2022 | Signature: ...................... | Date: 26 Mar 2019 |
| 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: 26 Mar 2019 |
| Client Representative: |  | Signature: ........................... | Date: ........................... |