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| **Phased Array Ultrasonic Corrosion Mapping Testing report**  **Протокол по результатам проведения коррозионного сканирования с применением фазированных решёток** |

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| **JOB DETAILS / РАБОЧАЯ ИНФОРМАЦИЯ** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Client**  Заказчик | | | **NCOC N.V.** | | | **Project**  Проект | | | | | **ESKENE WEST** | | | | | **Work Location**  Рабочая площадка | | | | | | | | **Unit 331 Tr2** | | |
| **JOB DESCRIPTION / ОПИСАНИЕ РАБОТ** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Brief Description of Job:**  Краткое описание работы: | | | | | | **Encoded Thickness Measurement Survey of** **Line 24” lines** | | | | | | | | | | | | | | | | | | | | |
| **Control object**  Объект контроля | | | | | | **A1-321-VF-102 (nozzle M1)** | | | | | | | | **Dimension**  Размер | | | | | | | | **24 inch** | | | | |
| **Material:**  Материал: | | | | | | **A333 Gr.6 SMLS** | | | | | | | | **Surface Condition:**  Сост. поверхности: | | | | | | | | **Painted** | | | | |
| **Nominal thickness:**  Номинальная толщина: | | | | | | **12 mm** | | | | | | | | **Part temperature:**  Температура поверхности: | | | | | | | | **+25°C** | | | | |
| **INSPECTION PROCEDURE / НОРМАТИВНЫЕ ДОКУМЕНТЫ** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Procedure**  Процедура | | **WI-11-PAUT-L03** | | | | | **Standard for testing**  Стандарт по контролю | | | | | **ASME sec V** | | | | | **Standard for item**  Стандарт для ОК | | | | | | | | **ASME B31.3** | |
| **INSPECTION EQUIPMENT / ОБОРУДОВАНИЕ ИНСПЕКЦИОННОГО КОНТРОЛЯ** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Equipment & Material**  Оборудование и материалы | | | | | | **Manufacturer**  Изготовитель | | | | **Serial No**  Серийный № | | | | | **Calibration certificate No**  Поверочный сертификат № | | | | | | | | **Calibration expiry date**  Срок действия поверки | | | |
| **OmniScan MX2** | | | | | | **Olympus** | | | | **103488** | | | | | **KZ-01-22-G-0312** | | | | | | | | **21.03.2023** | | | |
| **Step wedge calibration blocks**  **5-10-20-40 mm** | | | | | | **Fizpribor** | | | | **3255-20** | | | | | **-** | | | | | | | | **-** | | | |
| **EQIPMENT PARAMETERS / ПАРАМЕТРЫ ОБОРУДОВАНИЯ** | | | | | | | | | | | | | | | | | | | | **CALIBRATION BLOCK DETAILS / ПАРАМЕТРЫ КАЛИБР-ОГО БЛОКА** | | | | | | |
| **Mode**  Режим | | **Tx/Rx** | | **Filter**  Фильтр | | | | **BP 8 MHz** | | | | | **Points quantity**  Количество точек | | | | | | **640** | **Cal block**  Калибровочный блок | | | | | | **Step wedge** |
| **Frequency**  Частота | | **7.5 MHz** | | **Rectifier**  Выпрямитель | | | | **FW** | | | | | **No of elements**  Количество элементов | | | | | | **64** | **Material**  Материал | | | | | | **CS** |
| **Energy**  Напряжение | | **40 V** | | **Video filter**  Видео фильтр | | | | **On** | | | | | **Element pitch**  Шаг элементов | | | | | | **1 mm** | **Range**  Диапазон | | | | | | **5.0-10.0-20.0-40.0 mm** |
| **Pulse width**  Длительность импульсов | | **65 ns** | | **Averaging**  Усреднение | | | | **1** | | | | | **Ref sensitivity**  Опор. чувствительноть | | | | | | **+8 dB** | **Temperature**  Температура | | | | | | **+18°C** |
| **PRF**  Частота импульсов | | **Auto** | | **Velocity**  Скорость | | | | **5890 m/s** | | | | | **Scan sensitivity**  Чувствительность при сканировании | | | | | | **+4 dB** | **Correction**  Поправка | | | | | | **n/a** |
| **Probe**  Датчик | | **7.5L64-l4** | | **Wedge**  Призма | | | | **HydroFORM** | | | | | **Couplant**  Контактная среда | | | | | | **Water** | **Accuracy**  Точность | | | | | | **±0.1 mm** |
| **SCAN PLAN / ПЛАН СКАНИРОВАНИЯ** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **№ Group**  № группы | **Scan type**  Способ сканирования | | | | **Beam type**  Тип УЗ | | | | **Index offset**  Смещение | | | **Active elements**  Кол-во активных эл-в | | | | | | **First element**  Первый элемент | | | **Last element**  Последний элемент | | | | | **Element step**  Шаг элемента |
| **1.** | **Linear** | | | | **Compression** | | | | **30.5** | | | **64** | | | | | | **1** | | | **64** | | | | | **1** |

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| **CALIBRATION DETAILS (OmniScan MX2) / РЕЗУЛЬТАТЫ КАЛИБРОВКИ** |
| **Graphical user interface  Description automatically generated** |
| **INSPECTION DESCRIPTION / ОПИСАНИЕ КОНТРОЛЯ** |
| **Phased Array inspection was carried out on Intermediate Survey of Line A1-321-VF-102 (nozzle M1) KE01-A1-360-PO-P-DI-3170-001. 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.** |

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| **INSPECTION DRAWING / СХЕМА КОНТРОЛЯ** |
| Diagram, schematic  Description automatically generated |
| **A1-321-VF-102 (nozzle M1) KE01-A1-360-PO-P-DI-3170-001** |

| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | |
| --- | --- |
| **Location A1-321-VF-102 (nozzle M1) KE01-A1-360-PO-P-DI-3170-001** | |
| Chart, funnel chart  Description automatically generated  Y  X | **Data collected with (0-1960 mm) on X-axis, (0-300 mm) on Y-axis. Datum point is located on 20 mm from circumferential weld. Scanning was carried out in counter clockwise direction against to flow** |
| A screenshot of a computer  Description automatically generated with medium confidence | |
| The minimum thickness of the **Location A1-321-VF-102 (nozzle M1) KE01-A1-360-PO-P-DI-3170-001** | |
| A picture containing text, electronics, display  Description automatically generated  NOZZLE  WELD | |
| Full scan view with the minimum thickness area of the **Location A1-321-VF-102 (nozzle M1) KE01-A1-360-PO-P-DI-3170-001** | |

| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | | | | | | | | | | | | |
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| **Control object**  Объект контроля | **Location number**  Номер точки | **Description**  Описание | **Ø, inch** | **Nominal thickness, mm**  Ном. толщина, мм | **Date** / Дата | **Minimum thickness, mm1**  Мин. толщина, мм | **Maximum thickness, mm1**  Макс. толщина, мм | **Area of maximum thickness loss, mm**  Зона наибольшей потери металла, мм | | | | **Average thickness, mm**  Средняя толщина, MM |
| **Start X**  Старт Х | **End X**  Конец Х | **Start Y**  Старт Y | **End**  **Y**  Конец Y |
| **A1-321-VF-102**  **KE01-A1-360-PO-P-DI-3170-001** | **Nozzle M1** | Nozzle | 24 | 12 | 07.03.2022 | **12.02** | 12.72 | 1300 | 1500 | 0 | 100 | 12.37 |
| *Notes:*   1. *Echo to echo UT technique was used.* | | | | | | | | | | | | |

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| Examined by / Контроль провёл: | | Approved by / Протокол утвердил: | | Client representative /  Представитель клиента | |
| Name / ФИО | Kishore kumar P | Name / ФИО | Raman Barsukou | Name / ФИО |  |
| Signature / Подпись |  | Signature / Подпись |  | Signature / Подпись |  |
| Date / Дата | 07.03.2022 | Date / Дата | 07.03.2022 | Date / Дата |  |
| Cert. № /  № серт-та | PAUTLevel-II OH020S62822150  expdate: 11.09.25 | Cert. № /  № серт-та | PAUT Level II  cert. No 1A 354/18  exp date: 31.07.2023 | Cert. № /  № серт-та |  |