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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 520** | | |
| **JOB DESCRIPTION / ОПИСАНИЕ РАБОТ** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Brief Description of Job:**  Краткое описание работы: | | | | | | **Encoded Thickness Measurement Survey of A1-520-TA-002** | | | | | | | | | | | | | | | | | | | | |
| **Control object**  Объект контроля | | | | | | **A1-520-TA-002** | | | | | | | | **Dimension**  Размер | | | | | | | | **According to table** | | | | |
| **Material:**  Материал: | | | | | | **SA516 Gr.60** | | | | | | | | **Surface Condition:**  Сост. поверхности: | | | | | | | | **Smooth painted surface** | | | | |
| **Nominal thickness:**  Номинальная толщина: | | | | | | **7.00 mm** | | | | | | | | **Part temperature:**  Температура поверхности: | | | | | | | | **+2°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 VIII division I** | |
| **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 MX3** | | | | | | **Olympus** | | | | **QC-0076875** | | | | | **001-20210303-12111121** | | | | | | | | **12.03.2022** | | | |
| **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 mm** |
| **Pulse width**  Длительность импульсов | | **100 ns** | | **Averaging**  Усреднение | | | | **1** | | | | | **Ref sensitivity**  Опор. чувствительноть | | | | | | **8 dB** | **Temperature**  Температура | | | | | | **+5°C** |
| **PRF**  Частота импульсов | | **Auto** | | **Velocity**  Скорость | | | | **5890 m/s** | | | | | **Scan sensitivity**  Чувствительность при сканировании | | | | | | **+3;+6 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 / РЕЗУЛЬТАТЫ КАЛИБРОВКИ** |
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| **INSPECTION DESCRIPTION / ОПИСАНИЕ КОНТРОЛЯ** |
| Phased Array inspection was carried out on bottom plate **of tank A1-520-TA-002.**The, scanning areas were 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 drawings 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. |
| **INSPECTION DRAWING / СХЕМА КОНТРОЛЯ** |
| PAUT ON BOTTOM TANK  **A1-520-TA-002**  SOUTH    EAST  WEST  NORTH |
| **A1-520-TA-002 (ROW3 PLATE1,2&3)**  **BOTTOM ROW-3 PLATE-1,2&3 SKECTH** |
| |  |  | | --- | --- | | **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | | | **Location-1 (ROW3 PLATE1)**  **A1-520-TA-002** | | |  | **Data collected with (0 to - 300) mm on X-axis, (0-300 mm) on Y-axis. Datum point is located on the East side. Scanning was carried out from north to south by X- axis and from east to west by y-axis.** | |  | | | The minimum thickness of the **Location-1 (ROW3 PLATE1) A1-520-TA-002** | | |  | | | Full scan view with the minimum thickness area of the **Location-1 (ROW3 PLATE1) A1-520-TA-002** | | |

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| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | |
| **Location-1 (ROW3 PLATE2)**  **A1-520-TA-002** | |
|  | **Data collected with (0 to 400) mm on X-axis, (0-400 mm) on Y-axis. Datum point is located on the East side. Scanning was carried out from north to south by X- axis and from east to west by y-axis.** |
|  | |
| The minimum thickness of the **Location-1 (ROW3 PLATE2) A1-520-TA-002** | |
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| Full scan view with the minimum thickness area of the **Location-1 (ROW3 PLATE2) A1-520-TA-002** | |

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NOZZLE

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| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | |
| **Location-2 (ROW3 PLATE2)**  **A1-520-TA-002** | |
|  | **Data collected with (0 to 300) mm on X-axis, (0-300 mm) on Y-axis. Datum point is located on the East side. Scanning was carried out from north to south by X- axis and from east to west by y-axis.** |
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| The minimum thickness of the **Location-2 (ROW3 PLATE2) A1-520-TA-002** | |
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| Full scan view with the minimum thickness area of the **Location-2 (ROW3 PLATE2) A1-520-TA-002** | |

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| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | |
| **Location-1 (ROW3 PLATE3)**  **A1-520-TA-002** | |
|  | **Data collected with (0 to 300) mm on X-axis, (0-300 mm) on Y-axis. Datum point is located on the East side. Scanning was carried out from north to south by X- axis and from east to west by y-axis.** |
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| The minimum thickness of the **Location-1 (ROW3 PLATE3) A1-520-TA-002** | |
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| Full scan view with the minimum thickness area of the **Location-1 (ROW3 PLATE3) A1-520-TA-002** | |

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| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | |
| **Location-2 (ROW3 PLATE3)**  **A1-520-TA-002** | |
|  | **Data collected with (0 to 400) mm on X-axis, (0-500 mm) on Y-axis. Datum point is located on the East side. Scanning was carried out from north to south by X- axis and from east to west by y-axis.** |
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| The minimum thickness of the **Location-2 (ROW3 PLATE3) A1-520-TA-002** | |
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| Full scan view with the minimum thickness area of the **Location-2 (ROW3 PLATE3) A1-520-TA-002** | |

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| Examined by / Контроль провёл: | | Approved by / Протокол утвердил: | | Client representative /  Представитель клиента | |
| Name / ФИО | VIJAY D. BOBADE | Name / ФИО | Raman Barsukou | Name / ФИО |  |
| Signature / Подпись |  | Signature / Подпись |  | Signature / Подпись |  |
| Date / Дата | 10.11.2021 | Date / Дата | 02.11.2021 | Date / Дата |  |
| Cert. № /  № серт-та | PAUT Level II  Cert. № M015S62821013  exp date: 13.09.2025 | Cert. № /  № серт-та | PAUT Level II  cert. No 1A 354/18  expdate: 31.07.2023 | Cert. № /  № серт-та |  |

| **INSPECTION RESULTS / РЕЗУЛЬТАТЫ КОНТРОЛЯ** | | | | | | | | | | | | | | |
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| **Control object**  Объект контроля | **Location number**  Номер точки | **Scanned area, mm**  Область сканирования, мм | **Description**  Описание | **Ø, inch** / дюйм | **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, мм |
| **Start X**  Старт Х | **End X**  Конец Х | **Start Y**  Старт Y | **End Y**  Конец Y |
| **A1-520-TA-002 (Row3 Plate1)** | LOC-1 | 0-300 | plate | n/a | 7mm | 05.11.2021 | 7.19 | 8.50 | 23 | 63 | 25 | 45 | 7.50 |
| **A1-520-TA-002**  **(Row3 Plate2)** | LOC-1 | 0-400 | plate | n/a | 7mm | 05.11.2021 | 6.51 | 8.30 | 170 | 210 | 110 | 209 | 7.60 |
| LOC-2 | 0-300 | plate | n/a | 7mm | 6.57 | 8.40 | 143 | 180 | 226 | 262 | 7.50 |
| **A1-520-TA-002**  **(Row3 Plate3)** | LOC-1 | 0-300 | plate | n/a | 7mm | 05.11.2021 | 6.77 | 8.37 | 139 | 145 | 119 | 125 | 7.5 |
| LOC-2 | 0-400 | plate | n/a | 7mm | 6.63 | 8.30 | 50 | 71 | 267 | 287 | 7.5 |
| *Notes: Echo to echo UT technique was used.* | | | | | | | | | | | | | | |