**1. General.**

* 1. Operations Subdivision No 2 (OS-2) Hydrogen Generation Unit (S-800) heater KR-801 catalyst tubes Ø134x12, steel 25Cr35NiNb (Paralloy grade H39WM), dwg. DW 0121-001 and pigtails Ø44,5x8, steel ASTM B 407 UNS 8811, dwg. DW012-003

were installed according to TECHNIP KTI S.p.A design and put into operation at AB ORLEN Lietuva on 28 Nov 2008. Product in catalyst tubes: steam/gas mixture with the following parameters:

* PS (catalyst tubes) 33.0 bar
* TS (catalyst tubes) 9410C
  1. Heater KR-801 design lifetime is 100000 hours. Operating time as of Q3 2025 is 136386 hours.
  2. On 13 April 2022 and 14 October 2024, Institut Dr. Foerster GmbH& Co KG conducted an external laser eddy current inspection for all catalyst tubes (204 pcs) and pigtails according to an approved program. They recommended to perform another inspection of catalyst tubes and pigtails after 2-3 years of service.
  3. To perform external laser eddy current inspection of catalyst tubes and pigtails of heater KR-801 (for identification of cracks and changes in diameter) and to ensure their safe and reliable operation, these services need to be outsourced from the contractor(s) performing such works.

**2. Attachments.**

* 1. OS-2 HGU heater KR-801 drawing DW0131-002.
  2. OS-2 HGU heater KR-801 catalyst tubes drawing DW0121-001.
  3. OS-2 HGU heater KR-801 pigtails drawing DW0121-003 (2 pages).
  4. OS-2 HGU heater KR-801 laser eddy-current inspection diagram for 2027.

**3. Description and specifics of work.**

**3.1. Description of work.**

1. Familiarization with and analysis of the documentation of OS-2 HPU (S-800) heater KR-801 reaction lines and outlet pigtails (by Contractor).

3.1.2. Performance of external laser eddy-current inspection of KR-801 catalyst tubes (with catalyst not completely removed) (Ø134x12) and outlet pigtails (Ø44,5x8), with catalyst unloading/loading operations carried out at the same time. (by Contractor).

**3.2. General requirements.**

3.2.1. Contractor shall provide a work execution schedule with specified works, duration of works and the number of working personnel.

3.2.2. Contractor shall ensure the presence of supporting staff to move/relocate laser eddy-current inspection equipment during inspection of catalyst tubes.

3.2.3. Contractor shall perform a laser eddy current inspection (identification of cracks and changes in diameter) for heater KR-801 catalyst tubes (204 pcs.) and outlet pigtails in Operations Subdivision No 1 (OS-2) Hydrogen Generation Unit (S-800) according to a pre-approved program.

3.2.4. Works shall be performed in April-May 2027 in 2-3 days during Refinery Turnaround.

3.2.5. Within 24 hours following the external laser eddy current inspection, Contractor shall provide preliminary conclusions on the findings of inspection and recommendations on necessary repairs or replacement of elements, etc.

3.2.6. Proposal shall include the description of materials, tools and equipment which are going to be used for the inspection.

3.2.7. The Contractor is required to have all necessary personal protective equipment and, before start of works, fulfill requirements prescribed by AB ORLEN Lietuva OHS Procedure for Contractors BDS-40.

3.2.8. The Contractor shall have the transport needed to perform the works.

**3.3. Requirements for documentation.**

* + 1. Within 24 hours following the external laser eddy-current inspection, submit preliminary findings and recommendations on necessary repairs or replacement of elements.
    2. Within 30 days following the external laser eddy-current inspection, submit final inspection findings, which must include an analysis of the inspection conducted vs 2024 and 2027 inspection results as well as changes in the metal structure.

**3.4. Qualification requirements for Contractor.**

* + 1. Similar work experience. Provide a list of similar works performed during the last 3 years, indicating at least 2 heaters inspected for operating life identification during a calendar year. YES / NO
    2. For evaluation and proving of Contractor’s qualification, the following must be presented:
       1. A copy of the company’s registration certificate. YES / NO
       2. Lists of personnel that will perform the requested works. Copies of staff qualification certificates, etc. YES / NO
    3. Performance of all the specified works. YES / NO
    4. Schedule matches the indicated terms. YES / NO
    5. Work Safety Plan shall be provided by the Contractor upon contract award.
    6. The Contractor’s manager shall remain onsite during the works for handling all technical issues that might arise during the inspection.

**4. Materials, equipment, and services to be provided by the Owner.**

* 1. Preparation of OS-2 HGU (S-800) heater KR-801 catalyst tubes and outlet pigtails for external laser eddy-current inspection (installation/removal of scaffolding and insulation, preparation of surface for visual inspection, lighting, power supply) (by AB ORLEN Lietuva).

**5. Materials, equipment, and services to be provided by the Contractor.**

* 1. The Contractor shall indicate in its proposal what preparation of the surface of catalyst tubes and pigtails is required for laser eddy-current inspection as well as the amount and height of required scaffolding.
  2. All the materials, equipment and mechanisms required for laser eddy current inspection of the heater KR-801 shall be provided by Contractor.
  3. Equipment used by contractors must comply with the European Union occupational safety requirements.
  4. Contractor shall arrange rooms/premises for its staff. In case of need, premises may be rented from ORLEN Lietuva on contract basis.

**6. Requirements for work completion.**

6.1. External laser eddy-current inspection of KR-801 catalyst tubes and pigtails shall be considered complete after the Contractor submits a signed preliminary report to be approved by AB ORLEN Lietuva Maintenance Department Equipment Technical Supervision and Materials Analysis Group Manager.

**7. Work shall be considered accepted after:**

* 1. External laser eddy-current inspection of KR-801 catalyst tubes and pigtails shall be considered finally accomplished after the Contractor submits a signed final report to be approved by AB ORLEN Lietuva Maintenance Department Equipment Technical Supervision and Materials Analysis Group Manager.

**8. Requirements for work schedule.**

* 1. The preliminary start of inspection is April/May 2027. Inspection shall be performed in 2-3 days in consideration of the catalyst unloading activities performed at the same time.