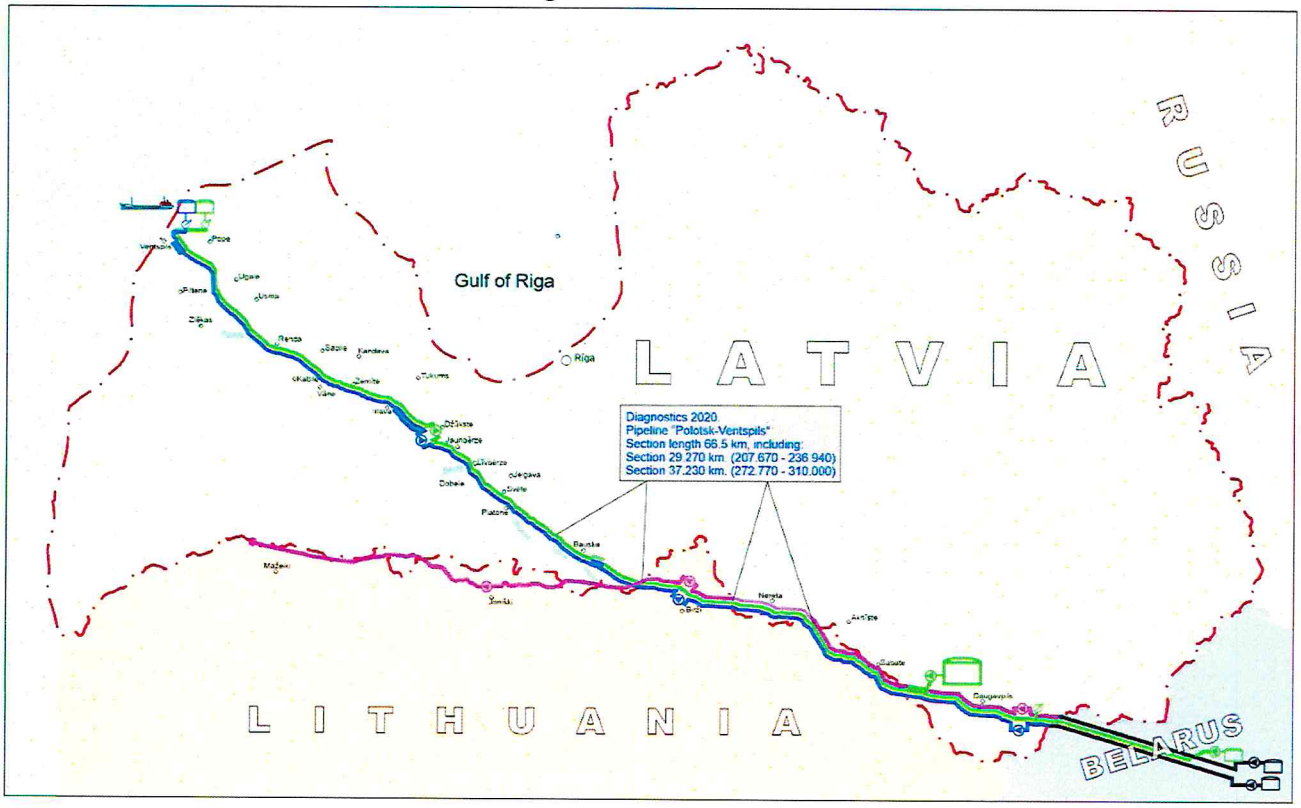
Technical Requirements Specification
for Cathodic Protection Diagnosing
and Determination of the Insulation Coating Condition
for the Polotsk-Ventspils Main Pipeline

1. Work Site

1.1. The Polotsk-Ventspils main oil product underground pipeline in the territory of the Republic of Latvia was built in 1972, made of 530-mm diameter steel pipes, steel grade '17GS' and 'C', (seamless pipes according to the technical specification TP 208.1-C-002/66 of Czechoslovakia Soviet Social Republic) with 7.5-9 mm wall thickness pipes and MBR IL-90 bitumen insulation (in Russian МБР ИЛ-90). The section to be diagnosed: from the state border of the Republic of Lithuania, landmark 208/220 km – 330m till the state border of the Republic of Lithuania, landmark 236/248 km+940m (Memele River) and from the state border of the Republic of Lithuania, landmark 273/285 – 230m till the landmark 310/322 km. Total length of the section is 66.5 km.

Map with the plan of the section to be diagnosed:



2. Purpose of Inspection

2.1. To determine condition of the main pipelines anti-ccorrosion protection and corrosion level/state.

2.2. To determine condition of the insulation coating (the aspects to be determined are insulation coating resistance, places of its integrity damages, and changes in physicomechanical characteristics).

2.3. To determine the efficiency of Cathodic Protection (hereinafter – CP).

2.4. To specify and classify detected corrosion defects in accordance with their danger.

2.5. To develop recommendations for operational safety improvement, and, in case of necessity, for CP equipment rearrangement.

2.6. To develop recommendations for insulation coating repairs with repair levels priorities.

2.7. To develop recommendations on next inspection terms and types.

3. Scope of Works

3.1. Analysis of the design, executive, and operating documentation of the pipeline sections;
3.2. Inspection of the pipeline corrosion state and insulation coating condition by the method of intensive measurements; the criteria of security by cathodic polarization in compliance with the LVS EN 14161+A1:2015 standard "Petroleum and natural gas industries - Pipeline transportation systems".
3.3. Inspection of the cathodic protection stations and measurements of resistance against anode groundings current spreading.
3.4. Determination of pipeline laying depth (to the top of pipe).
3.5. Detecting of presence or absence of CP hazardous impact on the main pipeline in the utility corridor or in the places of crossing with other underground communications/utilities.
3.6. Detecting of presence or absence of hazardous impact of stray current from high-voltage electric lines.
3.7. Detecting of presence or absence of pipeline electrical contact with the protective casings in the places of rivers or roads crossings;
3.8. Measurement of pipeline-earth potentials at the overground checkpoints, copper-sulphate reference electrodes functionality control.
3.9. Measurements of soil unit resistance with an interval of no more than 100 m.
3.10. Compiling a computer database of measurements in electronic and paper form upon the inspection results.
3.11. Analysis of inspection results, evaluation of technical condition of the CP equipment in the inspected sections. Generation of final reports with recommendations for each section.

4. Work Performance Requirements

4.1. The works shall be performed respecting the following requirement:
- 4.1.1. Regulations No 164 by the Cabinet of Ministers of the Republic of Latvia dated 23.04.2002 "Requirements to Main Pipelines and Procedure for Main Pipelines Technical Supervision";
- 4.1.2. The LVS EN 13509:2003 standard "Cathodic Protection Against Corrosion: Measurement Technique";
- 4.1.3. The LVS EN 14161+A1:2015 standard "Oil and gas industry – pipeline distribution systems".
- 4.1.4. Safety regulations for works carried out by contractors at "LatRosTrans" dated May 10, 2019. The regulation can be found on the LatRosTrans website: www.latrostrans.lv

4.2. The contractor shall be certified in accordance with the standards LVS EN ISO/IEC 17025:2005 "General Requirements for the Competence of Testing and Calibration Laboratories". In case the contractor doesn't comply with the mentioned accreditation, he is obliged to pass a competence test in an inspecting body accredited in accordance with the standards LVS EN ISO/IEC 17020 "Main Criteria for the Operation of Various Types of Bodies Performing Inspection".

4.3. The measuring equipment should be able to keep records in meters and have an internal or external GPS device (WGS-84 coordinate system) that coordinates measurements. GPS coordinates, and attaction to control measurment points and technological equipment, should be made by the organization operating in meter grade.

4.4. During the diagnostics, it is necessary to note the locations of all objects that may affect the assessment of the corrosion state (defects, roads, railways, river trenches, ponds, enclosed spaces, bushes, impenetrable swamps, ponds, power lines).

4.5. Requirements for measurments:

4.5.1. Accuracy of measurement of GPS coordinates: not less than 1 m.

4.5.2. The interval for measuring the depth of the pipeline: at least 20 m.

4.5.3. The accuracy of determining the axis of the pipeline: ± 0.5 diameter (265 mm).

4.5.4. Accuracy of measuring the laying depth of pipeline: ± 5 cm.

4.6. The contractor is responsible for the maintenance of the order at the work facility where the work is performed, as well as for the collection of waste resulting from work.

4.7. A final technical report should be prepared in electronic and printed form (3 copies) and contain:

4.7.1. Characteristics of the inspected (diagnosed) sections;

4.7.2. Characteristics of the applied measurement tools;

4.7.3. Defects evaluation criteria;

4.7.4. List of detected insulation defects;

4.7.5. Table of soil unit resistivity measurements;

4.7.6. The pipeline laying depth table (in electronic form);

4.7.7. Identification and classification of the areas for the insulation high-priority repair or replacement;

4.7.8. Conclusion with recommendations on work scope and terms for frayed coating restoration;

4.7.9. Action plan for bringing the pipeline anti-corrosion protection in line with regulatory requirements.

5. Requirements to Commercial Offers

5.1. An estimation of a commercial offer shall include all costs (including taxes, travel allowance, overhead costs, transportation costs).

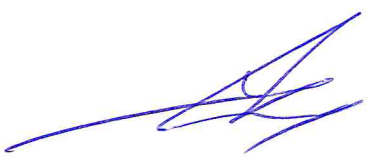
5.2. Calendar schedule.

5.3. The list of required equipment to perform work.

5.4. Information on the qualifications and experience of employees.

5.5. Commercial offers shall be valid during 90 days.

LatRosTrans LLC
Operation and Maintenance Director



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