

Technological Task 25	Application of fiberglass pipes within the CPPN.
Essence of the Problem:	High indicators of corrosion wear and deposits on the pipeline lead to a large number of leaks and accidents, significant heat losses of the pipeline, and high operating costs for insulation and heating. All this leads to high operating costs, including frequent and expensive repairs, causing equipment downtime. Protecting the pipeline by lining is a very costly and short-lived process in the case of high mechanical impurities, and does not eliminate heat loss costs. One way to increase the efficiency of the pipeline is to use composite pipelines. However, there is currently no regulatory framework for the use of fiberglass pipes and fittings at CPPN facilities.
Required Technological Parameters:	<ol style="list-style-type: none"> 1. General characterization of the production facility, study of technological regulations and features of technological cycles leading to corrosion and mechanical wear of pipelines and fittings. 2. Study of local areas of corrosion, deposits, and wear on pipelines and fittings at the field. 3. Modeling of the wear and deposition process using alternative pipeline materials (lined, composite, fiberglass pipelines). 4. Research in the field of mechanical, hydrodynamic, and thermal loads on pipelines to determine possible replacements with composite pipelines. 5. Laboratory studies and modeling of deposition and mechanical wear of composite pipelines to determine their service life. 6. Laboratory studies on the duration of operational characteristics under the influence of ultraviolet light, vibrational and dynamic impact loads, supercritical short-term thermal baric and mechanical loads, fine mechanical impurities, etc. 7. Laboratory tests of fitting elements with a metal/composite phase transition on operational characteristics similar to item 6. 8. Laboratory tests on the possible negative impact of reagents used in technological processes on the operational characteristics of the pipeline. 9. Development of a feasibility study for the application of fiberglass pipes within the CPPN. 10. Development of recommendations for testing pipelines and fittings made of composite materials for use in oil transportation and preparation processes. 11. Development of methods for defectoscopy of composite material pipelines during oil operations. 12. Recommendations for replacing ultrasonic flow meters with other measurement methods when using composite pipelines. 13. Based on the analysis of existing regulatory documents, materials, completed research works, domestic and foreign experience, develop regulatory documents for the design, construction, and operation of fiberglass pipelines at CPPN fields with obtaining permits from state authorities. 14. The main criteria for the design of fiberglass pipelines are: <ul style="list-style-type: none"> • Properties of the source materials for pipeline construction (pipes, connecting parts, fittings, insulation, ballast devices, etc.), which are determined by compliance with the requirements of current standards, ST, GOST for these products;

	<ul style="list-style-type: none"> • Reliability of pipelines under given operating conditions of pressure and temperature, which is determined by the compliance of the adopted structural solutions of pipelines (pipe wall thickness, burial depth, bending radii, etc.) with the requirements of current standards; • Safety, including fire safety, which is determined by the presence of appropriate safe distances from field pipelines to buildings and structures located in the pipeline zones; • Quality of construction, which is determined by the compliance of quality control results during pipeline construction with the requirements of current standards; • Stability of the pipeline position in space and over time throughout the entire service life. Fiberglass pipelines should be designed above ground.
Scale of the Problem:	Intensive corrosion of metal pipelines at CPPN, annual increase in repair costs, significant heat energy losses, leaks, and accidents.
Existing Methods for Solving the Problem:	<p>Develop a standard ST for pipes and fittings made of fiberglass composite materials (fiberglass) for use at CPPN facilities.</p> <ol style="list-style-type: none"> 1. Method of applying lining to the inner surface of the pipeline to combat corrosion and deposits. 2. Method of using pipelines made of special alloys and designs (individual units and devices) to increase corrosion and mechanical resistance. 3. Method of using digital predictive analytics systems to provide recommendations for adjusting technological regimes and dosing chemical reagents to combat corrosion.
Contact Person: Full name, position, phone, email.	
Expert Notes:	