

Ensuring the integrity of production facilities

We believe that improving the reliability of pipeline systems and lowering the accident rate at production facilities are

key components of industrial safety. We take a systematic approach to this, employing state-of-the-art technologies

Improving the reliability of pipeline transport

LUKOIL manages a well-developed pipeline system that comprises the most extensive system of offshore pipelines among Russian oil and gas companies. Efforts to ensure the reliability of the pipeline transport system are comprehensive and multifaceted in nature: we record all breakdowns in the integrity of the pipelines, analyze the reasons, and search for solutions that will ensure reliable and safe operation in the future.

Leveraging our extensive experience in operating pipeline transport in different geological and weather conditions, we select the optimum engineering solutions and apply the most tried-and-trusted methods.

Key measures to renovate and overhaul pipelines are planned as part of LUKOIL's investment program, with the investment cycle lasting at least 2.5 years.

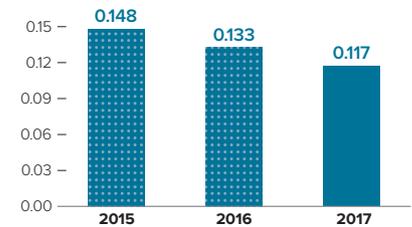
Diagnostics, the overhaul of pipelines, and the application of corrosion inhibitors are performed as part of operating activity, with some measures being performed under the Environmental Safety Program. Pipes made from modern materials, including new grades of steel, and with various protective coatings, are used when building and replacing pipelines.

Pipelines with anticorrosion performance were increased from 23.6% of the total in 2016 to 25.2% in 2017 (from 10,726 km to 11,755 km, respectively).

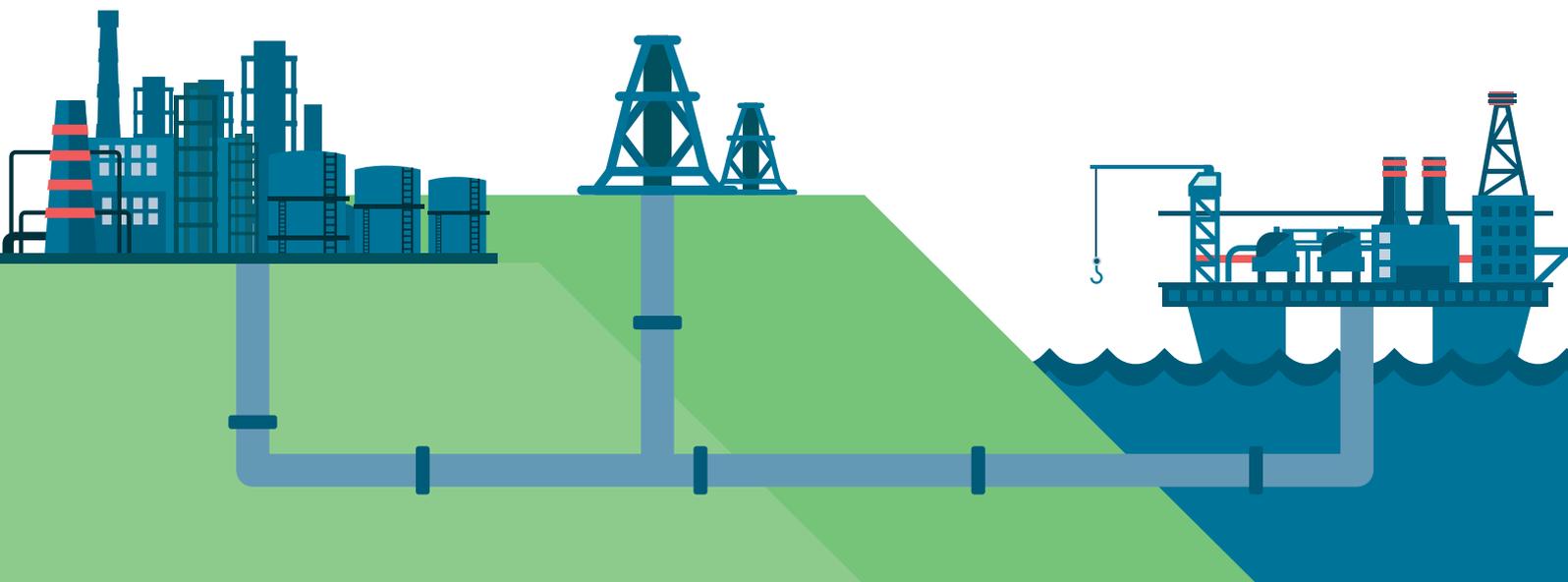
Our goal is to further improve industrial quality controls, including monitoring the actions of contractors in performing responsible technological processes at wells.

Through investment and sound engineering decisions we achieved in 2017 the lowest specific rate of pipeline failure for LUKOIL Group oil and gas production subsidiaries in Russia in the past six years: 0.117.

SPECIFIC RATE OF PIPELINE FAILURE¹, instances x km/year



¹ A pipeline failure refers to a malfunction involving a sudden full or partial pipeline shutdown due to a breakdown in the seal of the pipeline itself or the shut-off and control valves, or due to a pipeline blockage. Consolidated pipeline length figures are used when calculating results: oil pipelines, gas pipelines and water pipelines.



Implementation of the program to increase the reliability of pipelines in the Komi Republic

Increasing the reliability of the pipeline system in the Komi Republic is one of the Company's priorities. The replacement of pipelines in the region has increased substantially over the past three years: in 2017 this indicator exceeded the Company average by 1.3 times (in 2017, 3.6% of the total length of pipelines).

The Komi Republic is distinguished by having a combination of unique factors not present in any other oil and gas province in Russia which significantly affect the construction and operation of pipelines. Soil composition, the low load-bearing ability of the soil, and the formation conditions of the field all contribute to creating a highly corrosive environment (the rate of metal corrosion can reach 22 mm/year). Hence LUKOIL must, on the one hand, apply three times more corrosion inhibitor to protect pipes than in other regions (31% in Komi, 10% in other Russian regions), and, on the other, find technologies that will help extend the accident-free work of pipeline transport.

Steel pipes with internal and external anticorrosion coating are used effectively in this region. Every year when steel pipes are replaced, this type of pipe accounts for a much greater share of the total in Komi than the average for the Company. Their length equaled 1,100 km in 2016 and 1,335 km in 2017.

In 2017 we began the full upgrade of the 33-km Makariel-Shchelyayur pipeline, including the replacement of a section passing through the Pechora River (Izhma District). The completion of the project is scheduled for 2018.

The overall results of activities to increase the reliability of pipelines in the Komi Republic in 2017 compared to 2016 are as follows:

- an increase in the length of pipelines with corrosion inhibitors from 2,198 km to 2,282 km, representing over 30% of the total length of the Komi Republic pipeline system
- a rise in the total replacement of pipelines to 269 km (3.6% of the total length of pipelines)
- technical diagnostics being expanded to 1,768 km of pipelines



269

km

of pipelines replaced



1,786

km of pipelines

scope of technical diagnostics



> 30%

of the total length of the pipeline system in the Komi Republic is protected against corrosion

