Modern equipment for ILI inspection manufactured by Transneft Diascan

Currently, **Transneft Diascan**, a subsidiary of **Transneft**, carries out the following activities:

- develops and manufactures in-line inspection (ILI) tools and cleaning equipment;
- performs in-line inspection of the linear part of pipelines, issuing technical reports, including information on technical condition evaluation, repair terms and methods;
- monitors the technical condition of pipelines on the basis of periodic inspections and maintenance of databases;
- performs a full as well as partial technical inspection of tanks without shutdown;
- carries out general contractor functions for technical inspection and certification of pipeline facilities: process and auxiliary pipelines of oil pumping stations, mechanical and technological and power equipment, automation, telemechanics and anti-corrosion protection equipment.

The core activity of Transneft Diascan is related to in-line inspection of the linear part of oil, gas and product pipelines from 6” to 48” through the use of in-house produced ILI tools. Their operating principle is based on various physical methods of non-destructive testing. It includes geometry tools with navigation system, ultrasonic, magnetic, combined magnetic and combined magnetic and ultrasonic tools. All the ILI tools produced by Transneft Diascan are high resolution equipment capable not only of detecting defects, but also measuring their parameters and classifying them by type. This is a prerequisite for calculation of strength and durability of pipes with defects, as well as for the calculation of maximum pressures and operating life limits based on inspection results.

Transneft Diascan is operating in compliance with the international quality standard ISO 9001-2008. About 50,000 km of trunk oil pipelines and 5,000 km of oil product pipelines and process pipelines of oil pumping stations are inspected annually by the company. Transneft Diascan constantly modifies the existing ILI tools, develops the equipment using new inspection principles, and improves the quality of software products for processing ILI data.

The modified "Ultrasonic inspection tool 48-DKP" is intended to detect randomly oriented defects on 40”, 42” and 48” pipelines. The ultrasonic inspection tool is equipped with 3402 sensors of CD type and 1134 sensors of WM type. Nine groups of CD type sensors allow the detection of randomly oriented defects. This ILI tool detects and sizes such defects as corrosion, lamination, gouges and cracks both in pipe body and in welds.

The modern ILI tools of Transneft Diascan use the magnetic inspection principle, including MFL and TFI tools, as well as their combination. The magnetic ILI tools manufactured by Transneft Diascan are notable for a high level of the pipeline wall magnetization, as well as for using multi-component high-resolution magnetic field sensors comprising additional eddy current measuring channels. The magnetic ILI tools detect and size such defects as general corrosion, pitting corrosion, metal loss, welded attachment, gouges, and cracks, both in pipe body and in welds and excessive penetration. Combined magnetic-ultrasonic ILI tools allow identification of most defects in the linear part of pipelines within one run. Currently, the ILI tools are equipped to regulate the speed of movement within the pipeline systems, which improves the quality of these ILI tools while moving in difficult speed conditions, for example, within a gas pipeline.
An ILI tool with the use of electromagnetic and acoustic (EMAT) technology of sending and receiving of ultrasonic signals and an ultrasonic ILI tool with phased arrays are now in development. The EMAT ILI tool will allow the identification of all types of defects detected by ultrasonic ILI tools and to measure pipeline wall thickness. By this, the EMAT ILI tools are able to be successfully used in gas pipelines without liquid medium. All the manufactured ILI tools are checked and tested at the Transneft Diascan test site.

Transneft Diascan tools from 6’’ to 48’’