Russian Scientists Have Thought up how to Warm the Oil Pipeline and to Relieve it of Stirring Deposits

A Research team from Skoltech (Moscow) and Siberian Federal University have developed and carried out the first tests of the flow-type borehole generator intended to relieve oil-extracting equipment of organic deposits complicating hydrocarbon extraction.

The generator is lowered into the well using small pipes and heats the equipment by generating electricity and releases it from hydrates and paraffin deposits formed during pumping of oil. The invention has shown high efficiency in tests, has no analogues in Russia and in the world, is patented and will be used in the future at oil producing enterprises, including those in the Arctic.

According to Alexander Vasiliev (co-author of the project and director of the SibNeftegaz training and production site of the School of Petroleum and Natural Gas Engineering at Siberian Federal University), the shutdown of wells is an undesirable event that occurs due to natural causes – clogging of pipes with gas hydrates and asphalt-resin-paraffin deposits. To unblock the pipes it is necessary to heat them up – the effect is achieved due to the continuous flow of liquid, which, in turn, generates electricity, which melts the heavy components of oil that have deposited on the walls of the equipment.

> *"Our borehole generator heats the pipe wall locally, destroys along the way all the formations that narrowed the pipe opening and disrupted oil pumping. The well is returned to operation and can be further used for hydrocarbon production. The heating is quite fast and does not require any chemicals — thus, we will preserve specific soils, for example, the Arctic soils which require careful treatment and, in general, reduce the environmental burden on the environment,"* said **Alexander Vasilyev**.

The experts from Krasnoyarsk and Moscow already developed two prototypes of the generator: Khaton S-58 modification is designed to work in pipes with a diameter of 73 mm, and Khaton S-70 is suitable for pipes with a diameter of 89 mm (internal bore diameter of 75 mm).

> *"We conducted a patent search on all available databases and found out that there are no direct analogues of such equipment in the world. To date, a joint patent was received by SibFU and Servisneftegaztekhnologii Research and Production Company (Skolkovo, Moscow). In the future, additional tests will be carried out in order to eventually get closer to commercialization and widespread use of our invention in the oil industry of the Russian Federation,"* the researchers summed up.

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