

## **On results of evaluation of effectiveness of application of the Technology of seismic vibro-influence in order to increase oil production and possibilities of managing the stressed state of the medium**

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We conducted works for improving oil production and recovery using method of seismic vibro-influences (SVI) on Pervomayskoye and Komarovskoye oil fields from December 1996 until March 2002 and on Bondujskoye oil field from July 1997 until March 2002, which belong to Oil and Gas Production Department (OGPD) "Prikamneft" of Joint Stock Company "Tatneft" (Eurasian patent № 001474 from 18 December, 2000 "Methods for improving oil production").

The Technology is realised through applying vibro-influences on the entire territory of an oil field and allows controlling the stressed state of the medium. The managed decreasing of such stressed state leads to quick decline of the oil production. Consequently, managed increasing of the stressed state of the medium leads to rise of pressure inside the oil layers and level of oil extracted for a period of 6- 8 months. As per 1 June 2002 the amount of additional oil produced due to application of the Technology equalled, accordingly to protocols of OGPD "Prikamneft", 689.2 thousands tons. In reality, this figure is lower than the actual additional oil production as it was calculated without taking into account natural decline of oil production.

In this article the evaluation of effectiveness of the SVI method is given on the basis of comparative analysis of oil production data and changes of geophysical fields after works were discontinued. Most informatively changes of the stressed state of the medium are reflected in behaviour of high frequency seismic waves, microseisms and in variations of distributions of intensities of electromagnetic waves in all depths.

We stopped application of SVI in March 2002, yet we continued registration and analysis of microseisms and electromagnetic fields until September – November 2002. Changes of intensity of those fields, which have been registered after we had stopped SVI, point to significant and sharp decrease of energy in the medium, practically to levels of December 1996 when we started to realise SVI.

While analysing oil production data from March 2002 until December 2002, we took into account efforts, which OGPD "Prikamneft" undertook in order to maintain achieved level of oil production, being as follows: increase of water injection into reservoirs, on average by 45-55 thousands tons per month; some increase in number of oil wells; geological-technological works aimed at intensification of oil production; application of some other secondary methods. Those measures allowed OGPD Prikamneft to somehow compensate drop in the oil production which took place after we had stopped SVI. Data obtained by us explicitly testifies that, excluding positive effects of mentioned above measures, real decrease of the oil production from March 2002 until December 2002 was 7-8 thousand tons of oil per month on average.