



## **Relationship between Seismicity and Oil Production**

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The analyses of different aspects of negative impacts to environment have proved that any repeated industrial activity with even low scale impacts should be controlled to avoid triggering disturbances of natural balance, significant ecological and economical damage and occurrence of earthquakes by them. Non-controlled industrial activity on the territory with high tense sensitivity leads to activation of tectonic processes, amplification in a stress state of the medium and changes in seismicity.

The problem is related to understanding the medium as a dynamic object with constantly changing parameters and to the fact that high power events can appear even in areas that earlier were considered as low-seismic or even aseismic. This allowed working out criteria for medium's state diagnostic and solving the wide range of problems, concerning protection of the environment on a new methodical basis.

The studies of the "Starogrozny" oil fields have revealed the existence of some threshold for acceptable pressure differences in the medium, crossing which led to elastic or nonlinear deformation processes, appearance of vibration fields, etc and all together to the destruction of fields and drops in production.

We analyzed one of such impacts to medium by method of hydraulic fracturing, fracking, widely used in oil industry, and negative aftermaths caused by them. An additional energy which also causes the emergence of earthquakes is accumulated in the medium. For example, weak seismicity increased tenfold since the commencement of the "Guneshli" oil field development.

These negative effects revealed as a consequence of the same uncontrolled development of oil fields them and damaging mediums by using fracking method to a large degree in various regions of the world: Kaliningrad, Grozny and Siberia regions in Russia; Azerbaijan section of the Caspian Sea; Gulf of Mexico; Arkansas, Texas and other states in the USA; Blackpool in England.