ASSESSMENT OF THE POSSIBILITY OF GAS SHOW ELIMINATION IN THE BOVANENKOVSKOYE FIELD BY MEANS OF NEW CEMENTS

Background
Future increase in production of natural gas demands to develop new gas fields. Today the main gas producing region is Western Siberia where the major part of gas fields is located. In order to increase gas production in the nearest future, it will be necessary to start the development of new fields situated on the Yamal peninsula. The productive horizons of this oil and gas region have a complex geology, and some gas condensate reservoirs confined to Neocomian and Jurassic deposits have abnormally high formation pressures and temperatures above 100 °С. Special place among the Yamal fields takes the Bovanenkovskoye oil and gas condensate field. It is situated in the central part of the Yamal peninsula on the territory of the Yamal area, in the Yamal-Nenets Autonomous District of the Tyumen region. The region is featured by severe climate, slight solar radiation, high cyclonic activity, permafrost, flat terrain and proximity to the cold Kara Sea with its gulfs going far into the land.

Aims and Objectives
Preventing gas shows in the ice rich permafrost in the construction and repair of gas wells.

Methods
The study of the causes of gas shows in ice rich permafrost, development of cement compositions, laboratory and field tests.

Results
1. The Bovanenkovskoye field is formed by ice rich permafrost. Today, avoiding gas shows during well construction is impossible.
2. Various cement mixes were used during well casing and cementing to prevent gas shows. Cementing with the use of CemFrost gave lower coefficient of the cement bond with the casing and the rock, in comparison with the design TsTRO and TsTRS cements used for well casing and cementing.
3. The use of GranCem-7 cement slurry mixed with calcium chloride solution gave higher values of cement-to-casing adhesion coefficient, yet not sufficient for the cement-rock bond.
4. The advantage of GranCem-7 mixture is almost complete filling of the annulus, which significantly reduces the likelihood of gas show occurrence.

Conclusion
Since the work aimed at a comprehensive solution of the problem of cementing quality assurance without significant changes in technology was experimental, the results obtained in preventing gas shows can be considered ambiguous. However, when using the compositions based on GranCem-7 obvious is the need to change them so as to improve their gas blocking properties for reliable isolation of the lower interval of Beryozov formation.

The occurrence of gas shows between the intermediate and conductor casings in the wells being drilled in the Bovanenkovskoye field can be explained, first of all, by gas penetration from the upper layers of the Beryozov formation, as well as by the gas cross flows from the neighboring wells with annulus pressures.

Key words: gas show, cement composition, elimination, assessment, field
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