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MODELING PROCESS OF STOCK DRAINAGE DYNAMICS HYDROCARBONS

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Abstract
This article provides information on determining the field model by refining the hydrodynamic calculation of data obtained from the field and refining the variability of the productive formation when designing technological indicators for the operation of oil and gas fields.

Keywords: development, indicator, deposits, production, oil, gas, reservoir, heterogeneity, liquid.

Introduction

An analysis conducted in a number of works shows that the methods currently used for calculating technological and economic indicators in the design of oil and gas field development give different results in the presence of the same initial geological and production information.

Main part

The calculations of the technological indicators given in the work, which were carried out using methods according to the same law of permeability distribution under the same properties of the liquid, show that differences in the initial assumptions of a particular method of calculating process indicators do not significantly affect the choice of a rational development system. However, for one development system, due to differences in the dynamics of oil and liquid production over time, it is not indifferent by what method the calculations of process indicators are performed and the nature of their change over time is determined. This is especially important when planning the production of oil, gas and liquid for the future. Depending on the method used, for example, the method When calculating the water cut of the extracted product, an error in estimating oil production by year of up to 80-96% can be obtained.

Since it has been established that the greatest influence on the reliability of hydrodynamic calculations is exerted by the lithofacies variability of productive reservoirs, various methods strive to take into account, first of all, the influence of this factor. Based on the analysis of the dynamics of flooding of more than 300 highly flooded wells in deposits that differ in filtration characteristics in various fields, we concluded that it is advisable to predict the development of an oil reservoir for individual characteristic areas by elements, taking into account the dynamics of operating methods and equipment for oil production.

The variety of laws proposed to describe the heterogeneity of productive strata undoubtedly reflects the complexity and spatial variability of the lithofacies environment. Consequently, the scale effect, the relative size of the area for which the parameters are determined in a separate measurement, has a strong influence on the formation of an idea of the heterogeneity of the geological object under study. This, in turn, significantly affects the results of calculating the technological indicators of development. Thus, the following can be proposed to improve the methodology of technological calculations in the development of oil and gas fields: bring the data on the heterogeneity of strata to a single scale; take into account the effect of zonal heterogeneity by identifying small zones in the area of deposits, within which the productive strata can be considered homogeneous with a sufficient degree of accuracy or the geological and hydrodynamic model of which agrees well with the actual development indicators.

Conclusion

Therefore, a new direction has now emerged that combines, to a certain extent, calculation methods using stochastic and deterministic models. A deposit (pool) is divided into sections (zones) within which the productive formation can be considered homogeneous with a sufficient degree of accuracy or the hydrodynamic model of which is in good agreement with the actual development indicators. This approach uses a probabilistic model, since sections (zones) are distinguished that differ in the main parameters of the productive formations, and a deterministic model, since the location of each selected section (zone) is known, i.e. it allows for a smooth transition from stochastic to deterministic models.

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