видобутку, що є трендом енергетичної стратегії будь-якої держави світу. А для України це означає вирішення питання енергетичної безпеки і незалежності.

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# PRODUCTION DECLINING AND WELL OPERATION ANALYSIS

The choice of methods during well operation is one of the most important tasks of integrated design of oil fields, which are closely interrelated with other elements of the project and that significantly affect them and oil production. When choosing a method of oil production as the main indicators are technical, technological, operational, environmental, and social. One of the most important indicators when choosing is the planned flow rate during the "life" of the well. Predicting the flow rate of wells in fields with hard-to-recover reserves, characterized by nonlinear filtration, is one of the most difficult tasks in the development of oil fields. Nonlinear filtration is typical for cases of high-viscosity oil, as well as in conditions of simultaneous filtration of oil and gas. In

fact, quite often these deposits are developed by a system of horizontal wells, so the use of linear filtration formulas to calculate the flow rate of wells leads to significant errors in calculations. However, based on historical production data, the flow rate of wells is predicted using the Arps fall curve method. Arps fall curve method. The method of falling production curves according to Arps is a fast, convenient and empirical method used in the possible absence of reservoir parameters and without directly determining the hydrocarbon recovery factor. Applying this method requires approximating the actual production dynamics curves with typical curves to predict future oil and gas production, so it can be used for any type of tank. The decrease in the well is determined by the decrease in their productive characteristics, which eventually reach the critical limit of conditions that reduce their profitability.

Production reduction analysis is means of identifying productivity problems in wells to assess their future productivity and expected service life. Behavior of productivity at decrease in a deposit allows to define: a) pressure difference in a wellhead necessary for maintenance of a constant expense; b) deviation of the flow under constant pressure.

Initially, the analysis using drop curves was obtained from empirical observations of the behavior of production in gas and oil wells. Three main models that have historically been used in the analysis: a) a constant percentage of decline; b) hyperbolic fall; c) harmonious fall. The method of falling curves, which is reliable when used in mature wells, with a sufficient history of production and where temporary effects have been overcome. Data can be obtained without much risk of uncertainty, in contrast to deterministic, statistical, material balances and numerical simulation methods.

For the geologist, the analysis of the fall in production in a similar productive basin provides a basis for forecasting production and final extraction from the exploration area or phased drilling site. The productivity of a well decreases as it is produced, mainly due to some combination of pressure drop, displacement of another fluid (gas and / or water) and changes in relative permeability to the fluid.

Production drop curves are a simple visual representation of a complex production process that can be developed quickly, especially with the help of modern software and production databases.

The Harmony Enterprise platform is designed to analyze the performance of oil and gas wells and assess inventory, to create common corporate workflows, use technical knowledge and share interpretations, which allows you to identify promising assets, evaluation, and development strategy.

It considers the method of Arps fall curve as an effective method that allows reliable and efficient prediction of well flow, a necessary parameter for optimal and correct choice of well operation. Forecasting the flow rate of wells in fields with high-viscosity oil stocks is one of the most difficult tasks in the development of oil fields. However, the use of the Arps method simplifies this task, as it gives the correct results quickly and easily.

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