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Modeling operation of a complex trajectory oil well in unsteady state**Sergey K Sokhoshko**

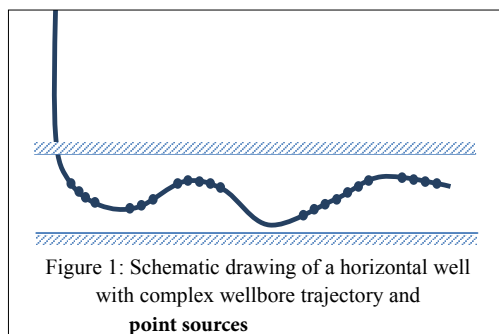
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Statement of the Problem: Nowadays horizontal wells become more widespread day by day. At the same time a wellbore trajectory in a productive formation can be quite complex (Fig. 1). In order to calculate total production rate of such a well or of its separate intervals it is very important to know the fluid to the wellbore movement profile, flow rate increment along the wellbore as well as pressure drop along the wellbore with time in order to make a pressure build up curve. The objective of this study is to obtain a solution and to develop a technique which would allow calculation of the above operation parameters for unsteady state of complex trajectory oil wells.

Methodology & Theoretical Orientation: The point source method was used to simulate perforations in the wellbore of oil well in order to calculate the complex trajectory well production rate. A solution for a fixed point source flow in an infinite formation with impermeable top and bottom was obtained using a function of a non-fixed point source flow in an infinite formation and a method of infinite imaging relative to the formation's top and bottom. Local pressure losses and hydraulic resistances in the wellbore were also taken into account as well as the changes in the modes of fluid movement in the wellbore.

Findings: Fluid movement to the wellbore profile, flow rate increment and wellbore pressure drop depend on the wellbore trajectory, productive formation parameters, well operation time, which have to be taken into account both in well planning as well as in field development design stages.

Conclusion & Significance: The designed technique allows to calculate in time the complex trajectory well productivity and its separate intervals, pressure drop in the wellbore, increment of the oil flow rate, as well as to calculate a theoretical pressure build up curve.

**Biography**

Sergey K Sokhoshko is a PhD holder he defended his PhD thesis at the Tyumen State Oil and Gas University (Russian Federation). Currently he is a Professor of the Department of Oil and Gas Fields Development and Production in the above mentioned university. He specializes in modeling of shallow horizontal wells and complex profiles, as well as hydraulic fracturing issues.

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