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Investigation on flow regimes and non-Darcy effect in pressure test analysis of horizontal gas wells

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Transient pressure test of horizontal wells compared to vertical wells is more complicated due to the occurrence potential of different transient flow periods. Although various mathematical models were developed to horizontal well test analysis their evaluation in different well and reservoir conditions needs more investigation. In specific, in vertical wells non-Darcy flow which causes an extra pressure drop have a significant impact on well test data but its impact on horizontal well test data needs more investigation. The objective of this paper is to examine transient pressure behavior of horizontal gas wells under various conditions including high velocity flow. The results show that the appearance of elliptical and pseudo-radial flow regimes depends on relative well length and formation thickness. In addition, the effect of off-centered wells respect to upper and lower boundaries in transient pressure data is expressed. The results also show that non-Darcy flow can cause a significant skin in transient data of a horizontal gas well. Magnitude of the skin is mainly affected by reservoir permeability and production rate of the horizontal well.

Biography

Shabnam Shahbazi is currently pursuing her PhD in Petroleum Reservoir Engineering at Amirkabir University of Technology (Tehran Polytechnic). She works as a Teacher in Petroleum Department of Science and Research Branch, Islamic Azad University. She is also working in Pars Oil and Gas Company from 2006. She is the Head of Upstream Section of POGC Phase-12 Project; this section is responsible for all upstream issues (geology, reservoir and drilling) regarding Phase-12 Project.

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