

Reserve estimation techniques in unconventional resources and comparison of different available methods

Shakeel¹; Yasir Ali¹; Atif Zameer¹; Tasaddaq Younas² and Mian Tauseef Raza¹

¹ *Petroleum and Gas Engineering Department, UET, Lahore, Pakistan*

² *Department of Earth Sciences, University of Sargodha, Sargodha, Pakistan*

mst.seefi@yahoo.com

Abstract

An energy crisis is looming large in upcoming years. The major shortfall is expected in natural gas supplies. Pakistan has 28 trillion cubic feet reserves (TCF) of conventional gas but due to increase in its demand it is expected to be depleted in next two decades. With the widening demand/supply gap we have to rely on the unconventional resources. So it is the need of the hour to develop them. According to Energy Information Agency (EIA) estimates, Pakistan has approximately 40 (TCF) of tight gas and 51 TCF of shale reserves and ranked 8th in the world in shale reserves. Unlocking these large unconventional reserves can expand the opportunity to reduce Pakistan's dependence on imports to overcome the current energy crisis and to fuel the industrial economy.

But to develop these resources is not as easy as conventional resources. There are a lot of challenges faced by industry in exploitation of these unconventional resources, starting from exploration, reserve estimation, drilling, and reservoir development. This paper will analyze the different methods used for reserve estimation in unconventional plays. Reserve estimation is an important factor in deciding whether to go for development or not. Unrealistic estimates can lead us to economic loss. The most common methods used to determine reserves are volumetric, flowing materials balance, decline curves analysis, and reservoir models. Assessment of strength and weakness of individual reserve estimation techniques will be presented in this paper and after doing the comparison of all these available methods an attempt is made to suggest the best method for reserve estimation in unconventional reservoirs at different stages of development.