



Title: Comparative analysis of Material balance equation and decline curve analysis for gas reservoirs

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ABSTRACT

Material Balance and Decline curve analysis are the oldest and the most common mathematical approaches for estimation of reserves. Pitfalls are associated with these techniques that leads to their continuous modifications. Still both their theory and practice continue to suffer widespread mis-understanding and lackluster implementation. DCA is not just a curve fitting exercise and should not be limited to isolated rate-time graph with sloppy defaults of most graphing programs. A practitioner should adept at creating different graphs and examined them in parallel. Arp's method should be used along with type curves that combine MBE with inflow performance relationship for a better evaluation. The conventional material balance (P/Z plots) for gas reservoirs require shutting-in the wells and measuring pressures at different points of time in the life of a reservoir. Material balance calculations can be performed without shutting-in the well, this method is known as flowing material balance (FMB). This method is proven to be a sound technique but limited to constant flow rate. Unfortunately, most wells do not flow at constant rate for extended periods of production. Dynamic material balance is the extension of FMB. It is applicable to variable flow rate. Non-linear behavior of gases is incorporated by using pseudo functions.

Three different case studies can be used to evaluate different MBE and DCA techniques. A constant BHFP production history for a dry gas reservoir can be utilized to compare Conventional DCA and Decline Type Curves. A constant rate production history for a dry gas reservoir to compare Flowing Material Balance (FMB) and Static MB techniques. Finally, a variable rate variable pressure production history for a dry gas reservoir can be used to compare Dynamic MB and Rate Normalized MB techniques.

Biography

I Muhammad Irfan have recently completed my Bachelors in Petroleum and gas Engineering from University of engineering and technology, Lahore, Pakistan. I have scored good grades in my Engineering.I am a executive member of Society of Petroleum Engineers,Lahore Student Chapter (SPELSC,UET Lahore). I have done internship in Oil and gas developement Pakistan I have keen interest and passion to work in Petroleum industry and to preent my knowledge at different forums.

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Category: (Oral presentation and Poster presentation)