



Guest Editorials

Unconventional Resources

Unconventional resources, particularly natural gas that is uneconomic without advanced technologies, are forecasted by the United States Energy Information Administration (EIA) to play an increasingly important role in the energy supply of the United States during at least the next 30 years. As conventional energy sources are depleted, these unconventional resources will also become more important throughout the world in the future. The technologies to develop these resources are developing rapidly, and four papers presented at OMAE2007 and selected for this special issue of JERT illustrate important developments that are underway.

The paper “Microhole Coiled Tubing Drilling—A Low Cost Reservoir Access Technology” documents the field performance of a drilling rig that is capable of drilling wells over 3000 feet deep in less than a day at a cost saving of approximately 30% compared to conventional rotary drilling rigs. This rig was field tested in the Niobrara unconventional gas play in Kansas and Colorado. Lower cost drilling techniques increase potential development opportunities in unconventional hydrocarbon accumulations.

“Basin Analog Investigations Answer Potential Characterization Challenges of Unconventional Gas Potential in Frontier Basins” presents novel methodology that will allow users to compare the key characteristics of relatively incompletely studied sedimentary basins outside of North America (where the incentive to develop unconventional gas resources in the past has been limited) to characteristics of more mature basins in North American (where the incentive to develop unconventional gas resources has been great). The methodology has been reduced to software and has been validated by comparison to expert opinion on North American basins most analogous to specific overseas basins of interest.

“Using Transient Inflow Performance Relationships to Model the Dynamic Interaction Between Reservoir and Wellbore During Pressure Testing” discusses new technology that will allow users to derive transient inflow performance relations (IPR) at bottom-hole conditions to link the wellbore to the reservoir during pressure buildup tests. Traditionally, most IPR analysis has been based on the assumption of steady-state, rather than transient, flow conditions, and has generally ignored transient conditions in the wellbore, where inflow rates may be significantly different from those at the surface.

The final paper selected from this session, “Quantification of Uncertainty in Reserves Estimation From Decline Curve Analysis of Production Data for Unconventional Reservoirs,” provides an advanced technique for analysis of reserves estimates using the most frequently applied method of reserves estimation for unconventional reservoirs, decline curve analysis. Interest in the upside and downside potential of the reserves in individual wells and fields has been growing in recent years for economic risk analysis and reservoir management purposes. This paper suggests an approach, using rigorous statistical analysis, to quantify uncertainty generally and upside and downside potential specifically.

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