TG20

Planning, Optimizing, and Evaluating Geologic Risk and Completion Performance in Tight Gas Reservoirs

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SUMMARY

The exploration and exploitation of unconventional gas resources is an expanding trend and is an interesting topic especially within the context of the international marketplace. Unlike the North American tight gas business, where thousands of wells are drilled yearly and the operational infrastructure is proven and in place, the international gas market challenges are significantly different. Rather than enjoying tens of wells to confirm reservoir properties and efficient completion techniques, most international tight gas projects have five or less wells to prove concept sustainability. Subsequently, the key risk is not the hydrocarbon resource itself, but instead the early recognition of areas where critical geological and reservoir factors exist to enable economic and sustainable field development plans. Additionally, the rapid identification and application of the most efficient completion solution is paramount to progress of an economically sanctionable project.

Hydraulic fracturing is a critical component of the completion process when appraising, developing, and producing tight gas reservoirs. However, for most regions outside of the large and well established stimulation markets, business and operational success for both operators and service providers is dependent on the ability to maximize the number of synergies while managing an integrated service offering. Therefore, the development of a tailored and carefully planned workflow; that enables speedy evaluation of both the geological and completion performance is essential. Tight gas reservoir understanding is not only limited to presence of hydrocarbons, reservoir distribution, fluid saturation, reservoir contacts, and other geological aspects but is also equally dependent on gas inflow performance (via hydraulic fracturing), ensuring economically attractive well test flow rates and confirmation of sustainable long term production. This generally includes a requirement for an extended well-test in order to confirm the long term reservoir/well behaviour. As a result, an appropriate technical and operational evaluation program for tight gas reservoirs was developed for this project that allowed for several wells to potentially demonstrate the extent, sustainability and nature of reservoir variability and productivity.

This presentation will illustrate, the workflow process also incorporates evaluation of these treatments in order to quantify hydraulic fracturing performance and reservoir deliverability. The application of a sound technical strategy, innovative well placement program, and a tailored workflow, provides the greatest chance of success in meeting crucial milestones. It is important that the project stays within technical and budgetary constraints while maintaining flexibility and options for modifications, while not jeopardizing future resource development.