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An Investigation into Uncertainty Correlation in Resource Plays

James R DuBois, 3esi-Enersight; William F Dunn, PPCLOAN; John P Strother, University of Texas at Austin

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Abstract

Unconventional plays requiring large, high cost development programs now dominate the North American onshore Oil and Gas business. Large drilling programs are often justified and forecast based on ‘type curves’: forecasts for a typical single well, intended to be repeated as many times as necessary to represent an extensive drilling program. When companies want to add uncertainty analysis to their forecasts, that work often begins with extending the type curve to include a range of possible single well outcomes, often by including the production forecast for a P10 and P90 well on the curve.

When Monte Carlo analysis is performed on this expanded type curve for a substantial program, the program uncertainty all but disappears. This is a simple illustration of the law of large numbers. There is still a considerable amount of uncertainty in resource plays, of course, but it is not due to well-to-well variation, at least in the long term.

We created a set of synthetic tight oil well data and subjected it to a number of Monte Carlo analyses to illustrate this point. In these analyses, we show that correlation among the wells accounts for far more of the uncertainty encountered than does well to well correlation. Factors that might be correlated include long term decline, drilling and completion cost and IPs due to interference and/or reservoir quality. Examples are shown for the decline and cost correlations.

The full paper is available for purchase at <https://www.onepetro.org/> or by contacting:

3esi-Enersight

info@3esi-Enersight.com