Modelling for Comfort?

Mark Bentley, TRACS Training, AGR

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Abstract

Reservoir modelling studies are widespread and are often built into a formal gated process used for decision making.

Now ubiquitous, it is easy for the models to simply become tools for verification of a decision that has partially or wholly been made – ‘modelling for comfort’. This is particularly the case in mature fields, when the presence of an inherited model already anchors the view of the field, and the volume of production data discourages the practitioner from exploring uncertainties with multiple models.

It is proposed that reservoir modelling offers most value when used to create some discomfort – a stress test for decision-making that can identify upsides and secure against loss. This requires an awareness of the biases at work in model design and a conscious choice to move away from the default of a single, detailed, full-field model. This ideally means moving away from base-case-led modelling altogether, and typically involves multi-scale model design and multiple models for uncertainty handling, based either on stochastic modelling or multi-deterministic, scenario-based approaches.

In an ideal world, reservoir modelling and simulation provide efficient and powerful quantitative tools for analysing uncertainty space surrounding an exploration and production (E&P) activity.

The tools can quantify the uncertainties, highlight risks and opportunities, and create a firm foundation for costly decisions.

In practice, the oil and gas professionals tend to build models that are big, inefficient and time-consuming for practitioners to construct and equally time-consuming for others to deconstruct. The models often end up supporting decisions that have already been made, and simply offer a sense of technical thoroughness. In this eventuality, we have been modelling for comfort. In the worst case, we may effectively be using the models to mislead ourselves and others. Why does this happen?