High Risk Analysis

There are many factors regarding Risk Analysis on HPHT wells which are different from “standard” wells.

Generally, risk is much higher – not only because the pressures and temperatures are higher (which have huge “knock-on” effects regarding things like rig selection, equipment, downhole operations etc.) but because HPHT rated rig rates are higher, well costs are higher – and the uncertainties (particularly on exploration wells) regarding pore pressure and fracture pressure are much higher.

The only true way in which to manage – and so mitigate / eliminate risk on HPHT wells is to study it. Study the sub-surface work. How accurate – on a rank wildcat exploration well – are the pore pressure, fracture pressure and temperature profiles?

If they are not “exact”, what is the range? If an accurate range has not been given to the Drilling Engineer, how can you expect a first-class well design (unless the casing design is very “generous” and “heavy” and there are liner contingencies).

Figure 1: Problems and cost over-runs rise exponentially on HPHT wells – not linearly

QRA (Quantitative Risk Analysis) is just one of IDEAS’ expert subject areas. We have provided QRA on HPHT wells for a range of Operators, which, addressing “Safety Factors”, allows us to focus upon those areas (e.g. casing design, drilling fluids, rig operational practices etc.) which require to be focused upon.
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Our methodology and QRA Software Program “Risk Impact” has enabled Operators to reduce / mitigate / eliminate risk from their HPHT drilling campaign in places ranging from the North Sea through to the Middle East and Asia.

Typically, if the proper QRA hasn’t been carried out, then errors will be made, as case histories show. The cost to an Operator in not getting the HPHT Well Design & Operations right can run into, literally, millions of dollars. For the Drilling Contractor it could also mean loss of contract and reputation. Both are preventable.

Figure 2: Risk reduction is not just about the 10% of things you can see – it’s principally about the 90% of things you cannot see