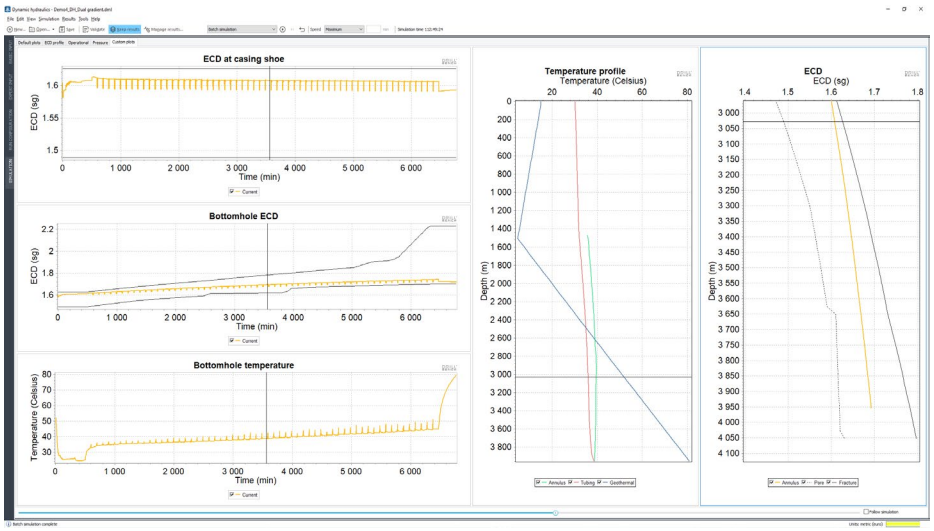
Drillbench
Dynamic Hydraulics

Efficient drilling operations with a minimal risk is the target for all wells. Understanding of how the drilling operations impact downhole pressures is a key to efficient drilling with minimum non-productive time, as it can avoid exceeding the available pressure window. A primary objective of all conventional drilling operations is to stay overbalanced to avoid kicks and well control incidents. Equally important is it to avoid breaking down the formation and ending up in a loss situation.

Drillbench™ Dynamic Hydraulics is an advanced hydraulics and temperature simulator and provides valuable insight on how the drilling operation is impacting the wellbore pressure and available margins. Based on dynamic simulations of pressure and temperature conditions, the user will get accurate and realistic predictions of the wellbore conditions. These can be used to optimize design and operations to avoid drilling problems and to help the drilling crew avoid potential drilling hazards.

The software can be used for a wide range of wells and is particularly useful in wells with narrow pressure margins. Such conditions are typically present in deep water and high-pressure high-temperature (HPHT) wells. The user can specify the operations planned for a section including drilling, circulation, rotation, or periods where the well is static, and both fast transients related to changes in operation, and slow transients resulting from thermal effects are included.

The user-friendly and intuitive interface enables efficient well planning, including specification of batch jobs for simulation of entire well sections. Extensive configurable graphics options simplify sensitivity studies and optimization of planned operations.



Validate that a hole section in a deep water well can be drilled with dual gradient without exceeding available drilling window.

Applications:

- Validate planned operations with respect to available pressure window.
- Fingerprinting and estimation of flow resulting from thermal expansion.
- Surge and swab calculations.
- Managed pressure drilling.
- Dual gradient drilling.
- Evaluate tool temperature exposure.
- Evaluate temperature variation in formation.
- Post evaluation and learning from previous wells.

Benefits:

- Improve drilling efficiency and minimize non-productive time.
- Reduce drilling risk by mapping of operations relative to pressure margins.
- Provide insight to avoid misinterpretation of wellbore dynamics and thermal effects.
- Obtain operational decision support through "what if" analysis.
- Training and awareness of drilling crew.

Features:

- Transient flow and temperature models.
- Advanced PVT modelling including thermal effects.
- Pressure and temperature dependent rheology.
- Surge and swab modelling.
- Calculation of gel breaking.
- Flexible geometry including eccentricity.
- Underreamer and flow-subs for modelling of special flow configuration.
- Booster pump specification.
- Calculation of heat transfer between well and formation.
- Efficient simulation workflow, including batch and interactive mode.