

DELFI Drilling Interpretation

Advanced drilling analysis for remote decision support

APPLICATIONS

- Analysis of all drilling-related data from vertical, deviated, and horizontal wellbores
- Hole condition monitoring
- Drilling efficiency monitoring

BENEFITS

- Prevents drilling problems by recognizing potential hazards ahead of time
- Improves the efficiency of drilling operations
- Establishes drilling KPI benchmarks
- Increases operational performance
- Enhances integration and knowledge application

FEATURES

- Single collaborative repository for all your drilling data
- Unique Drilling Efficiency workflow
- Full integration with the Techlog* wellbore software platform
- Multiwell displays and analysis
- Well performance monitoring against established KPIs
- Cross-domain data interpretation incorporating multiple sources
- Workflow customization capabilities with Python scripting
- WITSML write-back capability to the InterACT* global connectivity, collaboration, and information service for web viewers

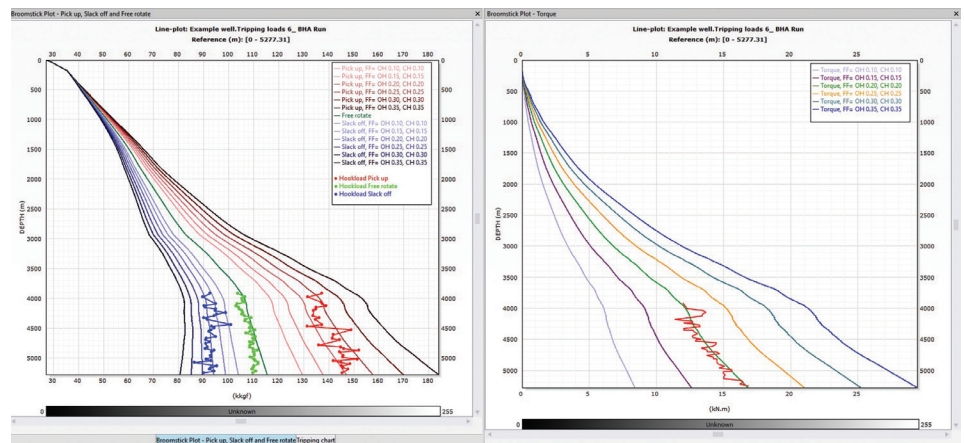
During the drilling of a well, real-time data monitoring is of paramount importance to ensure that work is conducted in a way that is efficient and prevents drilling hazards. It is also vital that a current operation is compared with previous wells to maximize on lessons learned. This comparable evaluation is not possible when using conventional drilling software, which focuses only on a single well for ease of use. Deployed in the cloud, DELFI* Drilling Interpretation provides real-time computations for each well and enables you to view results for multiple wells in a single cross-domain collaboration environment.

Define your operations

The rig state and drill state engines in DELFI Drilling Interpretation analyze a range of drilling parameters to determine the specific rig or drilling operation. Because these engines divide operations into a range of different states, such as trip in, trip in and pumping, trip out, rotating, in slips, and connection, they are a powerful analysis tool for highlighting drilling issues through integration with activity-based zonation of time or depth data. This gives you the ability to set KPIs and monitor operations performance against them.

Effectively monitor hole conditions

A key measurement in identifying whether wellbore stability or hole cleaning issues are present is the computation and analysis of the hookload during specific rig operations to determine the pickup, slack-off, and free rotation weights as well as the off-bottom torque. DELFI Drilling Interpretation compares the data to the computed model to enable you to evaluate any hole conditions that are imminent or occurring to plan remedial actions.



Broomstick plot of pickup, slack-off, and free rotation weights and off-bottom torque to monitor hole cleaning.



DELFI Drilling Interpretation

Improve cross-domain collaboration

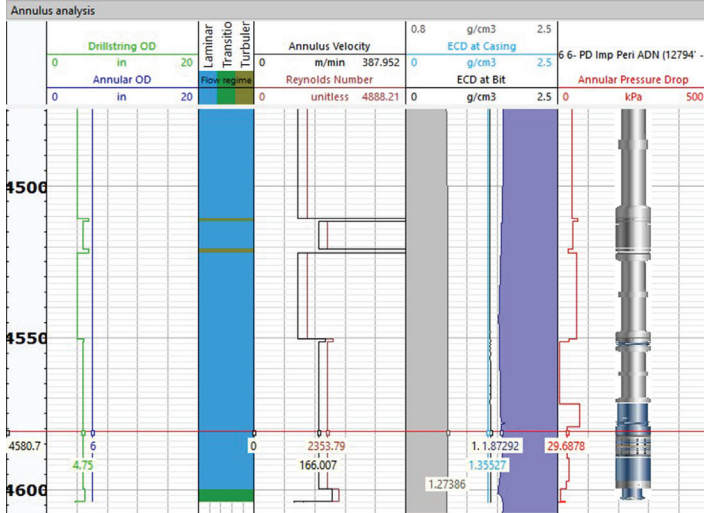
The Techlog platform connects to DELFI Drilling Interpretation to provide a large scope for collaboration among different domains for the drilling data. For example, as shown on the top right plot, the hydraulics method was used to compute the ECD at the bit and at the casing shoe, as well as the annular pressure drop across different elements of the BHA and the flow regime. Displayed with the computed ECDs is the mud-weight window to provide a collaborative answer that increases your understanding of the drilling environment while monitoring operations.

Enhance drilling performance analysis

Another application of the rig state engine is in analyzing the drilling operation to benchmark KPIs in real time or after the operation is complete. The Drilling Analysis task analyzes the rig state and drill state computations to provide the user with valuable information for benchmarking the operational performance of the rig: net and total drilling time per stand, connection-to-connection time per stand, net preconnection time per stand, and average ROP per stand, to name a few.

Increase drilling efficiency

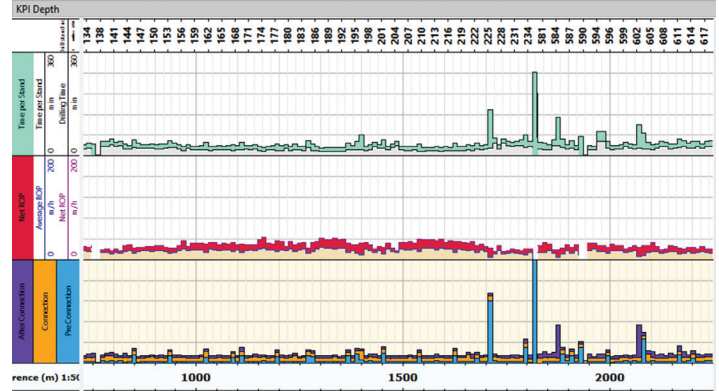
DELFI Drilling Interpretation introduces the unique Drilling Efficiency workflow which is used to calculate wear on the bit, so you can determine the amount of time required to complete the drilling section. This workflow compares the efficiency of a new bit, including the time to pull out of hole and resume drilling, with the current bit to help you make the best decision for your drilling operation.



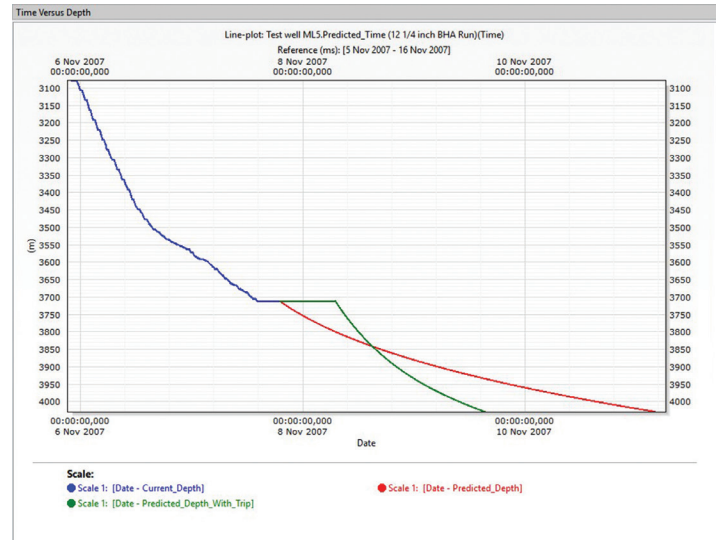
Hydraulics results integrating geomechanical computation of the mud-weight window.

Work more effectively in the DELFI environment

DELFI Drilling Interpretation leverages the power of our secure, cloud-based DELFI cognitive E&P environment. All drilling interpretation stakeholders can now perform and visualize computations, simulations, and modeling in a single digital workspace that enables more collaboration across disciplines and access to greater compute power than with conventional software licenses. The result is a much more fluid way of working for all users that increases efficiency and understanding at every stage of the drilling process.



Drilling performance analysis showing the breakdown for connection times and net-to-gross ROP times per stand throughout drilling of the well.



Drilling Efficiency workflow plot comparing the projection of bit wear to TD under current drilling conditions with pulling out and changing to new bit (green). The blue line represents current bit depth

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