Halliburton real-time operations change the way decisions are made during underbalanced operations to help you maximize your budget, optimize resources, reduce risk, and cut the amount of time needed for carrying out operations.

By utilizing powerful HalLink® satellite communications technology, Halliburton real-time operations bridge the distance between people and data. Reservoir data goes directly to the experts, enabling Halliburton and its clients to monitor and analyze underbalanced drilling projects without traveling to the wellsite.

**Applying Real-Time Technology Advantages**

The satellite communications system also enables direct access to the Halliburton technical information network as well as direct voice and e-mail access from the wellsite. This means quicker communication of vital information from the wellsite to support personnel and faster solutions for unexpected events. This enables collaborative decisions to be made, utilizing company expertise worldwide.

**InSite** (Integrated System for Information Technology and Engineering) data management system. To facilitate real-time decision-making during underbalanced drilling applications, Halliburton has integrated its data acquisition products with the field-proven InSite data management system. This networked wellsite information system enables us to integrate reservoir information for real-time analysis at the wellsite, the Real-Time Operations Center and the client's office.

**InSite Anywhere** service. This service provides customized access to well data without requiring complete installation of the InSite system. As long as the client has access to the Internet and the use of a Web browser, underbalanced applications data is as close as the nearest computer.
RTRE™ Real-Time Reservoir Evaluation for Increased Productivity and Safety During Underbalanced Operations

Reservoir evaluation during underbalanced drilling requires a constant stream of data from both surface and downhole sensors. The purpose of the dual-source data is to evaluate the productivity of the formations while drilling and to ensure the continuous safety of the operation. The data can also be used to quantitatively describe the reservoir.

Once all the required data has been collected, intermediary software is used to process and prepare data for the reservoir modeling and analysis. While it is not currently possible to measure the inflow rate at the sand face while drilling, a major component of this software adjusts the surface measured rates to downhole influx conditions.

A Proven Process

The mathematical model used by the analytical and numerical reservoir software is similar to industry-accepted models for transient well test analysis. However, in underbalanced drilling, the openhole wellbore length changes with time.

A history matching process is used to arrive at the reservoir permeability of the zones drilled. The known properties of the reservoir, such as porosity, compressibility, viscosity, and reservoir initial pressure are used in our proprietary software to iteratively derive the formation permeability of each zone. Halliburton’s proprietary software has the capability to resolve these added complexities.

Continuous Real-Time Formation Testing While Drilling

The RTRE Service delivers an ongoing well test while drilling. As a result, financial and production models for the well can be updated live at any time, enabling real-time decision making. Completion strategies can also be impacted immediately because the well’s potential is mapped out in detail.

Conventional well testing does not usually supply information about discrete pay interval permeability because all intervals are open at the time of the test. In RTRE, the advanced software application in an underbalanced configuration enables exactly this discrete pay zone by pay zone analysis. This ability to determine the productivity of a formation enables decisions on the viability of the well to be made earlier—before you invest in full completion and testing.

Applications

- Vertical, Inclined, or Horizontal Wells
- Single or Multi-zones/Layers
- Fully or Partially Completed Zones
- Single or Dual Porosity
- Anisotropy Considerations

For more information, contact us at sperry@halliburton.com