Real-Time Imaging and Dip Interpretation Improve Drilling Accuracy

Case Study: While-drilling visualization of high-resolution resistivity images targets well placement in Nigeria

**Challenge**
Precisely placing a 1,400-ft horizontal wellbore in a difficult 6-ft-thick sand interval in Nigeria.

**Solution**
While-drilling visualization and dip interpretation of real-time resistivity images using the WellEye® three-dimensional borehole data viewer and the GVR® geoVISION resistivity sub.

**Results**
The resulting interpretation of the geological marker beds and dips provided accurate real-time geosteering guidance. The true structural dip was revealed to keep the well in the target sand at 3.2 ft TVD deeper than expected.

**Accurate well positioning in difficult drilling environment**
While-drilling visualization and dip interpretation of real-time resistivity images were the key to precisely placing a 1,400-ft horizontal wellbore in a 6-ft-thick sand interval in Nigeria. The loose sand promised to be a difficult drilling environment, and there was no sand marker in 130 ft of TVD above the target sand.

**Powerful visualization at the wellsite**
These challenges were easily met by using the WellEye three-dimensional borehole data viewer to visualize and analyze real-time, high-resolution resistivity images from the GVR geoVISION resistivity sub. User-friendly WellEye software operates on a personal computer (PC) at the wellsite to provide 2D and 3D interactive displays of the borehole along the well trajectory. The interpreter can readily visualize the spatial position of log features on the dynamically linked displays.

WellEye functionality includes interactive dip picking and classification and manual scaling of images, features that previously were not available at the wellsite for while-drilling interpretation.

*GVR and WellEye guidance of the trajectory kept the wellbore in the 6-ft-thick sand.*
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Benefits
- Enhanced spatial perception of formation and borehole features and their relation
- Structural visualization in the context of complex wellbore trajectories
- Real-time interpretation and analysis for real-time decision-making

Features
- Dynamically linked two- and three-dimensional (2D and 3D) displays with innovative image navigation system
- Interactive 3D visualization of borehole images along the well trajectory
- Interactive dip picking and classification
- Manual image scaling
- Easy-to-use Windows®-based software

Dynamically linked 2D and 3D views of the GVR images and log data.

Accurate real-time interpretation of geological marker beds and dips
The resulting interpretation of the geological marker beds and dips provided accurate real-time geosteering guidance. The true structural dip was revealed to keep the well in the target sand at 3.2 ft TVD deeper than expected. The real-time image and dip data also made it possible to extend the planned 1,200-ft lateral section by an additional 200 ft.

E-mail dcs@slb.com or contact your local Schlumberger representative to learn more.