

Rotary Steering and Geo-Steering Drilling Technology

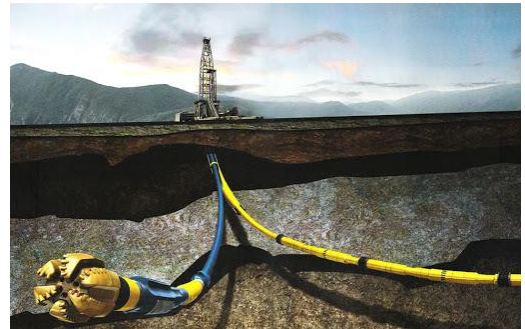
Rotary steering and geo-steering drilling technology, combining fast drilling and measuring tools, is able of dynamic adjustment on directional drilling, which is to ensure the drilling trajectory in the favorable position of reservoir, and significantly increase the drilling rate of reservoir, improve economic benefits, but also applied as technical methods on ultra-long horizontal well, thin oil bed and shale gas development.

Service Scope:

- Suitable for challenging horizontal well: low ROP, high borehole quality control, extended reach.
- Suitable for high drilling rate horizontal well: thin layer, tight oil/gas reservoir, and shale gas.

Technical Features:

- Continuous steering with string rotation, improve hole quality;
- Higher ROP, drilling time saving; and
- Real time formation measurement, increase the drilling rate.



Service Ability and Performance:

- The first oil service company to own RSS and Geo-steering system at China and independent supplier to provide geo-steering services;
- Completed the construction of over 100 wells with the following records:
 - Ultra-long horizontal section (3,070m) of shale gas horizontal well with deepest MD of CNPC – Ning21-5 Well (MD: 5,750m);
 - Deepest horizontal well onshore – ZG13-3H Well (MD: 7,849m, TVD: 6,527.43m);
 - Largest displacement well onshore – NP13-1706 Well (MD: 6,387m, Horizontal Displacement: 4,940.99m);
 - Maximum daily footage of 365 meters in horizontal section in China;
 - Over 10 wells drilling with 0.9m thin oil layer, with 90% + reservoir/sand coverage, in heterogeneous formation of the Putaohua, Songliao basin.

