

Turning Challenges into Opportunity – Lessons learnt from Data Acquisition in HPHT Horizontal Wells

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ABSTRACT

Petroleum Development Oman's tight gas flagship project recently advanced from the exploration/appraisal to the pilot phase. One of the key changes in well construction was piloting the first horizontal wells into these deep HPHT tight gas reservoirs to assess increased EUR/well compared to nearby vertical wells. One fundamental challenge encountered when drilling the first horizontal wells was that the established EWL logging strategy no longer could be pursued successfully, and, as a result, various alternatives needed to be established.

In 2012, the first horizontal well demonstrated that like in most unconventional projects, adapting the working strategy is a must. Where the down hole conveyance of logging tools in the project's vertical HPHT wells traditionally could be handled by conventional wireline equipment, it proved that deploying these tools on drillpipe (TLC) did not result in satisfactory results. Several workshops with various vendors finally resulted in a LWD solution that did not only overcome the logging challenge but turned out to be a commercial opportunity as well.

The third horizontal well drilled in 2014 with an open hole completion however required accurate calliper data that could not be acquired with LWD. A recent introduction to the market of an Open Hole HT tractor however was successfully deployed with callipers and presents a solution for other data acquisition in the next horizontal wells too. Similar to the learning curve witnessed in well construction by the well engineering team, the subsurface team has also gone through a steep learning curve with respect to data acquisition in horizontal wells. The journey from painfully slow and unreliable wireline data acquired on drillpipe to LWD with a limited tool set back to wireline tools but deployed with an openhole tractor was only possible through the increased understanding of downhole temperatures as a function of mud type and also availability of new technology.

This presentation will demonstrate the changes that PDO was required to perform to satisfy the projects data acquisition and drilling requirements whilst minimising risks and limit costs. We think that these are lessons that other participants of this conference can apply in similar assets too.