

# Providing Real Time Solutions

Logging While Drilling (LWD) is increasingly gaining popularity, with customers starting to look at drilling and evaluation services with a value-based, rather than a pure cost-based approach. GEO ExPro talked to Trond Graven in Baker Hughes INTEQ in Stavanger, Norway, about the status and future of LWD.

***In summary, what benefits do Logging While Drilling (LWD) have when compared to wireline logging?***

A major benefit is the improvement in the quality of logging data when measuring just after the formation is exposed. LWD also has the inherent ability to capture a 360° image of the entire borehole due to the rotation of the tools. However, in my opinion the greatest advantage of LWD is the ability to acquire and present the data while drilling. This gives us the opportunity to react to the information in order to improve the placement of the well, to better understand our reservoirs, to mitigate drilling hazards and to improve operational efficiency. That's the true value of LWD.

***LWD has gradually replaced wireline logging. Is this the beginning of the end for wireline logging?***

There has been an increasing shift from LWD to wireline logging over the last 5-10 years and I think we will continue to see this shift. There are still some areas and applications where wireline definitely will be around for years to come. Vertical exploration wells with fast deployment and logging and limited challenges with regard to well placement and drilling hazards will be such areas.

***The bottleneck in both MWD and LWD is transmission of data from the borehole to the surface. What is the latest development in this regard?***

We have seen and will see important changes in transmission speeds. The introduction of wired pipe telemetry is a paradigm shift in the industry. As this bottleneck is being removed, we will, for a couple of years, see an adjustment in the way the operator and ourselves use the information and make decisions based on this information. A colleague of mine compared this with the switch of internet-connectivity from dial-up to broadband. Traditional mudpulse telemetry will be around for many years though. Recent introductions of both downhole and surface mudpulse



Photo: Halfdan Carstens

Trond Graven has a M.Sc. in Petroleum Engineering from the Norwegian University of Science and Technology. He has worked with both oil companies and service organisations, and following a technical career, he is now sales and marketing manager, drilling and evaluation, for Baker Hughes INTEQ in Stavanger, Norway.

technologies have greatly improved telemetry rates and data. The amount of information available in real-time has increased 10-fold through smarter compression of data and improved bandwidth.

***A series of LWD tools has been introduced through the last couple of decades. Will this technology push continue?***

I definitely see the LWD technology push continuing. The technologies will be more widely used and the benefits will become more readily accepted. The combination of marginal field developments and less accessible reserves with high rig rates will push operators to try and minimize their operational risk while improving oil recovery. This, in turn, will drive further development and application of LWD technologies, as the need for real-time answers in these environments will become increasingly important as improved recovery of reserves becomes more challenging.

***You are dealing with customers on an everyday basis. Do you find that they are concerned about logging cost rather than seeing the possibilities for decreased overall cost and increased production?***

I think there has been a very positive development among our customers. We have more and more customers looking at drilling and evaluation services with a value-based, rather than a pure cost-based approach. This way of looking at things accounts for the value of specific services based on the total benefit for a project versus just the cost involved. Another trend that shows increased value focus is manifested through growing use of performance bonus agreements that provide win-win solutions for operators and service providers.

## Logging While Drilling (LWD)

LWD involves logging the properties of the formation and reservoir fluids while drilling and before drilling fluids invade the formation, similar to open-hole, wireline logs. The most frequently used measurements include gamma ray, resistivity, density, porosity, acoustic travel time and formation pore pressure.