# IDENTIFYING TECHNOLOGIES TO REDUCE DRILLING BUDGETS IN THE LOW OIL PRICE ENVIRONMENT

In the backdrop of current plunging oil price, rig counts remains half of what it was at the start of the year, thus operators need to streamline & restructure operations – especially drilling operations which is considered lion's share of rig days. Reducing the days required in reaching a target zone is the easiest way to reduce overall project cost and reducing risk of failure and increasing efficiency is another aspect of a drilling programme. The article explains advance technologies to increase directional drilling accuracy by facilitating new methods of data transmission and building upon existing reservoir characterisation methods.

Current oil prices remain low and the rig count remains half of what it was at the start of the year. These conditions are causing operators to restructure and streamline operations. With rig day rates being the lion's share of drilling operations, reducing the days required to reach a target zone is the easiest way to reduce overall project cost. Ultimately, this means reducing risk of failure and increasing efficiency for any aspect of a drilling programme. New technologies are solving these issues in several ways: increasing directional drilling accuracy, mitigating equipment failure, and ensuring wellbore stability.

To increase directional drilling accuracy, operators seek to better understand geology and improve downhole data transmission and analysis. Companies like Waveseis, which provides advanced seismic imaging for subsalt structures, can improve reservoir understanding and mitigate drilling hazards by providing more accurate subsurface imagery. Waveseis accomplishes this by using a proprietary algorithm that improves upon existing Reverse Time Migration (RMT) techniques. The oil and gas industry is also seeking ways to improve data transmission from directional tools. Improving data transmission has proved to be a difficult task to the oil and gas industry, which still relies broadly on mud-pulse systems.

XACT Downhole Telemetry and Evolution Engineering seek to provide alternative systems to traditional mud pulse. XACT's system uses acoustic signals sent through the drill pipe to transmit data from the borehole to the surface. Measurements are taken at the bottom of the drill string and transmitted to the surface through a network of distributed nodes. The system can operate independent of fluid flow unlike mud pulse systems. Just last January, XACT completed its first deepwater deployment in the Gulf of Mexico with BP. Evolution Engineering seeks to improve on existing technology by combining mud pulse telemetry and electromagnetic telemetry in one MWD tool. The tool has been designed to withstand high volumes of lost circulation material.

While there are complex solutions for mitigating equipment failure, such as data analytics for preventative maintenance, there are also options that reduce risk directly at the wellhead. 5D Oilfield Magnetics has developed a system that captures tools and metal shavings in a magnetic chamber above the wellbore. The system is viewed positively by Lux Research Analysts for delivering an actionable solution to an often ignored wellsite problem. 5D Oilfield Magnetics' Open Hole Net sits above the annular preventer and can be easily accessed by workers to remove tools or metal shavings. The company has also developed a tool specifically for managed pressure drilling. Tools accidentally dropped downhole can wreak havoc on expensive directional drilling tools, resulting in both down-time and expensive replacements. While there are no statistics on how many non-productive time cases are caused by dropped tools, mitigating one dropped tool incident could save operators hundreds of thousands of dollars.

Approaches to improving wellbore stability range from improved pore pressure predictions and real-time pressure monitoring services, provided by companies like Ikon Sciences, to dual drill string technology developed by Reelwell. In addition to these technologies, development of innovative lost-circulation materials has also been a topic of interest. Recent advancements include cross-shaped proppants developed by advanced materials company Hoowaki and nanocellulose crystalline by CelluForce. Hoowaki's X-shaped proppant, which won Statoil ASA and GE Oil & Gas' Innovation Challenge, is designed to tumble or flutter like a leaf, opposed to sinking straight down like traditional spherical proppant. While these materials have yet to be produced and deployed at commercial scale, early interest suggests "designer" materials could be more popular in the future.

## Conclusion

With prices likely to remain depressed and drilling activity reduced through 2016, start-ups in the oil and gas industry will be under more pressure to deliver innovations that reduce overall cost. While the barrier to entry is high, opportunity still exists for start-ups during the low oil price market. In the long-term, the industry will continue to advance drilling accuracy by facilitating new methods of data transmission and building upon existing reservoir characterisation methods. More near-term improvements could include market adoption of tools that act as added insurance against incidents that result in lost drilling time and expensive repairs. Overall, technologies with high-appeal will reduce cost by increasing drilling accuracy, mitigating equipment failure and improving wellbore stability.

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