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Achieving Superior Application Engineering: Proven Holistic Approach Disseminated to a Wider Community Key to Success

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Abstract

Delivery of performance through reduced well time while maintaining optimum wellbore quality requires a thorough understanding of the drilling environment, recognizing geological and drilling process hazards. Studying each component of the drilling system and environment in isolation prevents identifying the root cause of or fully understanding the problem, leading to less than optimal solutions and failure to deliver performance. To overcome performance barriers, we must first have an in-depth understanding of the root cause by taking a holistic approach to the analysis of the drilling environment.

This organization developed a successful process within a dedicated drilling optimization group that enabled a structured approach to understanding the complete drilling environment. This successful process, founded on the continuous improvement cycle—plan, execute, analyze, and capture—delivered practices and technology recommendations to realize performance gains and significant well-time reduction. Taking lessons learned from one well and implementing these on subsequent wells delivered further performance improvements.

The original drilling optimization group comprised a small team of highly disciplined engineers focused on detailed application analysis to minimize barriers to drilling performance improvement. This group's work was the foundation of drilling knowledge tools within the organization; this work led to the development of industry-leading methodologies for data analysis and best drilling practices.

The performance advantages realized by the team using this process lead the organization to recognize that its wider drilling community would benefit from the use of this process to deliver consistent performance gains.

The authors will describe the process and how it has been applied to the wider drilling community to meet the needs of individual engineering disciplines and groups.

The challenge to distribute the holistic approach and continuous improvement philosophy from a core group to the wider organization involved raising competency standards and the provision of dedicated knowledge transfer tools, creating an enabling environment to allow proactive performance management of specific applications. Finally, the authors will present several case studies that document success with the process.

Introduction

The pace of new technology introduction within the oil and gas industry is ever increasing. The catalyst is the rapid expansion of China and India and the general move east and the continuous demand on reaching pays once thought to be marginal or too technically difficult to produce. Often with the development of these technologies comes increased complexity when interpreting and understanding the application. This environment requires a better trained, highly skilled workforce that is in short supply and has been for some time. Those who have some seniority in a particular discipline, typically, now are in managerial positions and may not be available for technical support. Those that are left have become very focused on their area of expertise and, as a result, a systems approach for optimization whether it is on the drilling side or production side has become almost extinct.

As operators hand over more and more control for planning and implementation to the service companies, these companies optimize their technology offerings. This frequently occurs without necessarily thinking about other parts of the drilling system that interact with their products or of the impact on subsequent services and operations to complete the wellbore construction. This siloed approach often causes communication and operational issues, and, ultimately, affects the resulting cost of the wellbore. By not providing a holistic,