

Project Management Model Enables Operator to Deliver Well in Record Time in Venezuelan Field

DRILLING OPTIMIZATION REDUCES WELL CONSTRUCTION TIME BY ALMOST HALF

ORINOCO OIL BELT, EAST VENEZUELA

CHALLENGES

Halliburton collaborated with an operator in Venezuela to reduce drilling time, increase efficiencies, and avoid NPT by implementing a Project Management model.

SOLUTION

The Project Management model provided better control of the services, operational follow-up, risk prevention, proper information administration, better communication among all involved parties, drilling performance improvements, and availability of dedicated logistics resources.

RESULTS

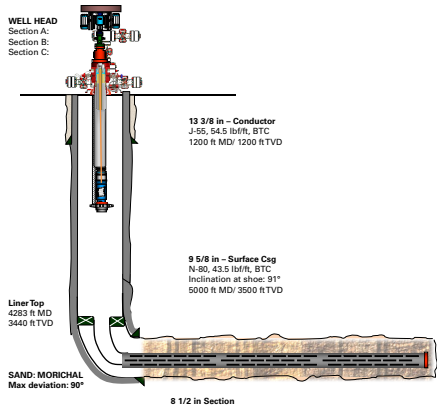
Implementing the Project Management model enabled the operator to:

- » Reduce well construction time by 45 percent
- » Improve productive time by 20 percent
- » Reduce NPT logistics by 95 percent

OVERVIEW

In Venezuela, an integrated Halliburton technical team collaborated with an operator to achieve drilling optimization in the Carabobo field. The field's offset wells, which have an average depth of 9,000 feet (2,743 meters), were typically drilled in an average of 45 days due to problems such as incurring rig surface equipment failures and waiting on rig crews and vacuum trucks, among other issues. By implementing the Project Management model, drilling time was reduced to 23.3 days, thus reducing the well construction duration by approximately 50 percent.

Mechanical Status

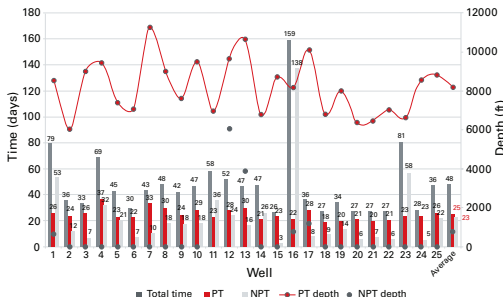


Well profile

CHALLENGES

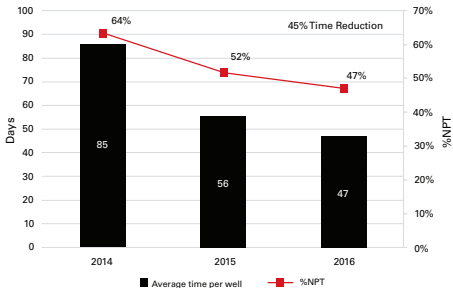
Venezuela contains billions of barrels of extra-heavy crude oil and bitumen deposits, most of which are situated in the Orinoco Oil Belt (OOB). The OOB, located in southeastern Venezuela, is one of the largest, essentially untapped, oil accumulations in the world. North of the Orinoco River, the belt stretches approximately 435 miles (700 kilometers) from east to west, with an area of approximately 20,850 square miles (54,000 square kilometers). The OOB is composed of soft, unconsolidated reservoir sands of Miocene age. In the Carabobo block, the extra-heavy oil reservoirs fall into three gross intervals: Lower, Middle,

Productive Time and NPT



Productive time vs. NPT

Average Time and %NPT 2014-2016



Improvements in drilling performance

Through implementation and execution of the optimized plan, it became clear that more integration between the service company and operator in a proactive and collaborative environment resulted in better drilling performance.

and Upper Morichal formations that are at a shallow true vertical depth (TVD) of less than 3,500 feet (1,067 meters) and consist of abrasive sands. Cuttings bed circulation and removal are among the main challenges in extended horizontal wells. Increasing the rotating speed can help alleviate this issue, but the abrasiveness of the formation could cause additional vibration, wear, and/or damage in directional tools.

Logistics and equipment efficiency are also challenges. Coordination and quality assurance (QA)/quality control (QC) of equipment, tools, and materials are essential for achieving good results.

SOLUTION

The operator followed several suggested steps to apply best drilling practices. The first step was to implement a customized Project Management model that grouped discrete drilling service contracts under a centralized structure. This ensured the best performance of these services and also supported and promoted best practices for the rig operations and complementary services. It also created better control of the services, operational follow-up, and risk prevention.

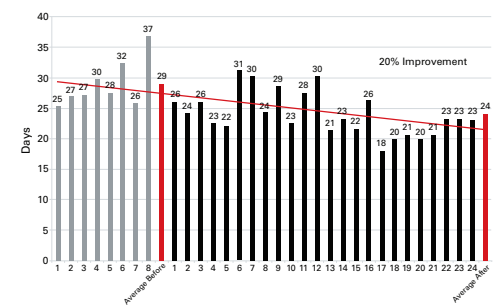
In addition, periodic service quality meetings were established to review drilling efficiency and operational safety, and to discuss lessons learned. These initiatives promoted better communication among the involved parties, initiated improvements in drilling performance, and provided dedicated logistics resources for the drilling operation.

RESULTS

Building a drilling optimization culture based on the synergy and integration between the operator and Halliburton was key for achieving better drilling results and superior performance. It became clear that more integration between the service company and operator in a proactive and collaborative environment resulted in better drilling performance. This organizational change offered additional opportunities to continue improving the operation, allowing the application of best practices and new technologies in the block.

As a result of implementing a Project Management model, one well was drilled in a 2016 field record of 23.3 days, increasing the well construction rate from an average of 331 feet/day (101 meters/day) to 438 feet/day (136 meters/day), and shifting the operator mentality to increase the level of integration to include wellsite supervision, well engineering, logistics coordination, and rig maintenance and repair. Overall well construction time was reduced by 45 percent, NPT was improved by 20 percent, and nonproductive time (NPT) due to logistics issues was reduced by 95 percent.

Days Per Well (Productive Time)



Days per well improvement

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