Halliburton Team Optimizes Drilling Performance in Ecuador’s MDC and Inchi Fields

**OVERVIEW**

Halliburton Project Management (HPM) in Ecuador collaborated with an operator to drill a vertical exploratory well in Ecuador’s Intracampos fields – specifically in the area’s Inchi and Mauro Davalos Cordero (MDC) fields. The drilling and completion of this well led to new oil reserve discoveries, and its execution exceeded the operator’s expectations. Halliburton has since been awarded four additional wells in this field. In this project, several Halliburton product service lines (PSLs) – including Drill Bits and Services, Sperry Drilling, Baroid, Wireline and Perforating, Cementing, and Completion Tools – and third-party companies actively participated to add value to the overall project, which was coordinated by the HPM team.

**CHALLENGES**

» Optimize drilling time
» Minimize nonproductive time (NPT)
» Lead and coordinate project between Halliburton product service lines and third parties
» Increase overall productivity while also decreasing overall risks

**SOLUTIONS**

Multi-PSL Halliburton team, led by HPM, provided:

» BHA optimization
» Customized drill bits via DatClM process
» GeoForce® motors
» iCem® cementing service
» Tailored drilling fluids

**RESULTS**

» Drilled first well in 17.4 days, significantly ahead of plan, thus achieving record as fastest well drilled in Inchi field to date
» Fifth well also achieved record as fastest well drilled to date in MDC field
» Completed entire operation with zero NPT
» Halliburton received four extra well assignments due to its excellent performance on these wells

**CHALLENGES**

Drilling time optimization in the MDC and Inchi fields is very difficult to achieve, due to well schematics in this field that only consider two sections: a 16-inch drilling section with a 13-3/8-inch intermediate casing, and a 12-1/4-inch drilling section with a 9-5/8-inch production casing for this type of well. The operator’s drilling campaign target was set to reduce at least 5 percent of the total campaign drilling time and 10 percent of the costs vs. the total campaign drilling AFE. These outstanding results led by HPM were accomplished by managing risks using bow-tie methodology. In doing so, the project incurred less than 1 percent of nonproductive time (NPT).

**SOLUTIONS**

Exhaustive offset well information analysis was performed in order to determine opportunity areas for maximizing drilling performance in the MDC and Inchi fields – including the bottomhole assembly’s (BHAs) formational tendency, drilling fluid properties to enhance hole stability and zero formation damage, operational best practices, and cement slurries designed for heterogeneous formations. Collaborative solutions through exhaustive planning were developed prior to initiating the first well scheduled for the drilling campaign in the MDC and Inchi fields.

The planning process included technology selections based on specific objectives, including cost benefit analysis, Drill Well on Paper (DWOP) methodology, peer reviews for the final drilling program, pre-spud meetings in the office, and, finally, spud meetings in the field.
The Halliburton solution included BHA optimization, customized drill bits via the Design at the Customer Interface (DatCI®) process, GeoForce® motors, the iCem® cementing service, and tailored drilling fluids for hole stability.

RESULTS

The first vertical well in the Inchi field was drilled in 17.4 days (significantly ahead of the plan) and with zero NPT – achieving a record as the fastest well drilled in the Inchi field to date. The fifth well drilled also achieved a record of being the fastest well drilled in the MDC field, and it was also completed with no incidents or accidents. Due to these outstanding results, four directional wells were also assigned and successfully drilled – ultimately achieving a reduction in total project time of 11 days, representing a 10 percent improvement in optimization time compared to the plan. A cost reduction of almost USD 5 million was optimized vs. the AFE plan, obtaining a 15 percent reduction in the key performance indicator (KPI) of U.S. dollars by feet ($/ft) drilled.

Time vs. Depth Curve

USD 4.94 million and 11 drilling days

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