



Gulf of Mexico Operator Drills Longest and Fastest 16-1/2" x 19" Salt Section in Deepwater Field

ICRUISE® INTELLIGENT RSS WITH CRUISECONTROL® TECHNOLOGY AND THE DRILLDOC® SERVICE SET A NEW ROP BENCHMARK

GULF OF MEXICO, USA

OVERVIEW

When drilling appraisal wells through a salt section in deepwater Gulf of Mexico (GOM), operators are always met with challenging conditions. The most common challenges are inclusions, sutures, unexpected lithologies, stuck pipe, and excessive torque and vibration. Careful planning and execution are required to ensure a successful drilling campaign.

CHALLENGES

- Engineer and design a bottomhole assembly (BHA) that delivers customer objectives
- Drill and enlarge 16-1/2" x 19" hole section in a deepwater salt formation
- Build a challenging directional profile inside the salt while limiting wellbore tortuosity
- Deliver superior wellbore quality to deploy structural casing

SOLUTIONS

- DrillingXpert™ enhanced modeling and engineering software suite – for optimized and customized BHA design
- iCruise® intelligent RSS – for precise steering control in highly demanding conditions
- CruiseControl® Technology – to deliver a smooth trajectory and minimize wellbore tortuosity
- DrillDOC® Optimization Service – to monitor downhole BHA dynamics in real time

RESULTS

- Drilled longest and fastest hole section in the field
- Applied maximum drilling parameters without hindrances, driving performance through salt
- Delivered a smooth wellbore trajectory, allowing a successful structural casing run

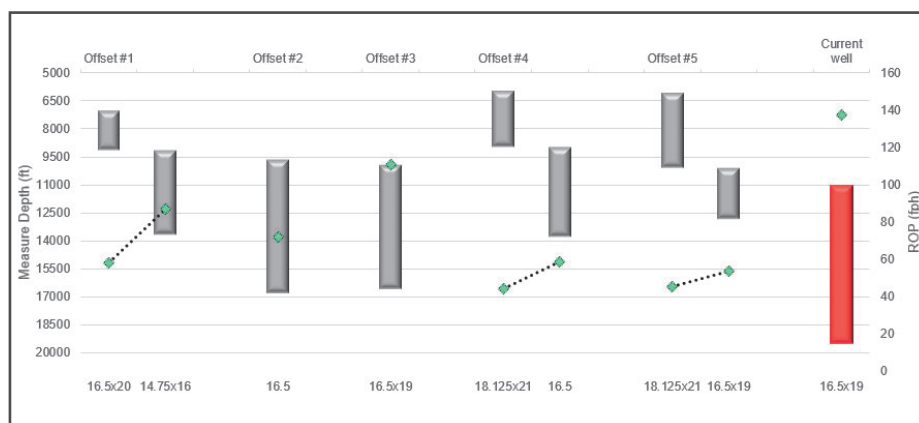
CHALLENGES

The operator's main objective for completing the hole section was to build a directional drilling profile, which included a vertical, kickoff, tangent, and drop back to vertical—all in salt. The complex plan was to simultaneously drill and enlarge the wellbore using an underreamer to be able to deploy a contingency casing string if needed. A smooth trajectory was necessary to be able to run structural casing without any issues. In order to obtain the best possible drilling performance inside salt, potential challenges had to be addressed while operating the bottomhole assembly (BHA) at the top end of its technical capabilities.

SOLUTIONS

The Halliburton Sperry Drilling GOM team first conducted an extensive offset well study to identify the key hazards and opportunities for improvement. The iCruise® Intelligent Rotary Steerable System (RSS) was selected due to its fully rotating push-the-bit design, with high mechanical specifications for geosteering in the most challenging environments. The optimum BHA and iCruise RSS hydraulics were customized using the DrillingXpert™ engineering software suite to support maximum drilling parameters, minimize damaging vibration, and deliver precise trajectory control across the entire hole section.

GLOBAL RECORD FOR
9-1/2" ICruise RSS
IN 16-1/2" X 19" HOLE
SECTION DELIVERING
8,515 FT IN A SINGLE
RUN WITH RECORD ROP.



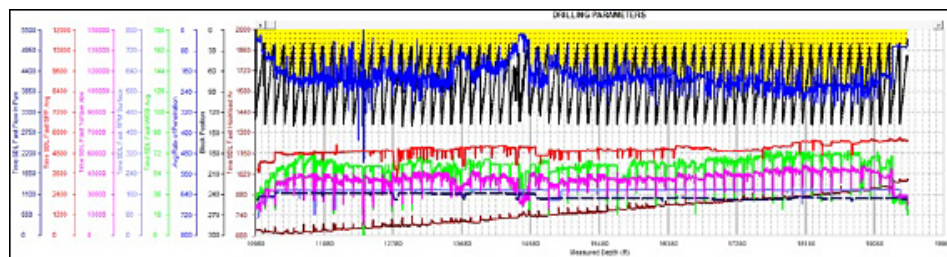
Footage and ROP comparison of the current well (red bar) against offset wells (gray bars) showing 21% more footage and 20% ROP improvement compared to best offset.

Additionally, the DrillDOC® Optimization Service was employed to provide real-time measurements of weight, torque, bending moment, and 3-axis vibration within the BHA. This data gave the operator the needed confidence to apply maximum drilling parameters and deliver superior drilling performance.

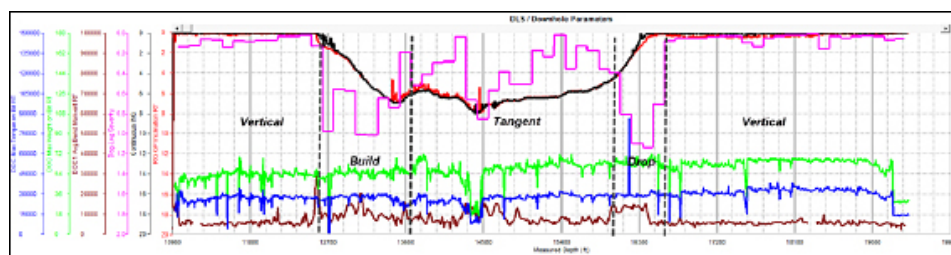
RESULTS

A successful run was completed, setting a record for the deepwater GOM field in terms of most footage and fastest average rate of penetration (ROP) on bottom. The section length was 21% percent longer, and ROP was increased by 20% versus the best competitor's performance on offset wells. During drilling, ROP in salt reached instantaneous values up to 245 ft/hr in a section with dominant inclusions throughout, delivering high performance while maintaining very low vibration levels the entire time. A new global record was established for the 9 1/2-in. iCruise RSS with 8,515 ft drilled in a single run.

iCruise vertical and CruiseControl® downhole automated steering modes autonomously drilled a smooth trajectory with excellent dogleg severity (DLS) control. The average DLS during the vertical was 0.07°/100 ft, allowing a successful structural casing running without any tight spots.



Depth-based drilling plot, showing real-time data for various drilling parameters.



Depth-based iCruise and DrillDOC downhole measurements across the Vertical-Build-Tangent-Drop-Vertical path, including DLS (pink line).

Results obtained on this highly engineered, offshore appraisal well opened the opportunity to plan and execute longer intermediate hole sections, helping the operator to save time and money on contingency scenarios, minimizing the project footprint.

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