

Thailand: Managed Pressure Drilling (MPD) and real-time produced gas measurement using CARBONTRACKER gas meter

“I am convinced that the MPD equipment provided a significant operational advantage that allowed this well, deepest in Thailand, to be drilled with fewer casing strings and minimal hole problems compared with similar wells drilled in Northeast Thailand.”

Julian Butcher, Vice-President, TATEX Thailand LLC

THE PROBLEM

- Challenging drilling in highly fractured carbonate reservoir with potential for high gas flow rates
- Wildcat well and operators limited experience in Thailand
- Historically slow drilling rates from other wells in the same area

THE SITUATION

- MPD was considered as the technology for this project
- As this was the first M-I SWACO MPD project in Thailand, there were challenges associated with this well
- Remote location (Northeast Thailand)
- Short equipment delivery time frame
- Equipment ability to safely handle significant volumes of gas at surface
- Operators ability to quickly respond to the uncertain downhole pressure environment

THE SOLUTION

- M-I SWACO designed a “fit for purpose” MPD package with ability to safely flow and gas at surface, while drilling
- AUTOCHOKE, designed to maintain constant near bottom-hole pressure (Pressure Balance Choke)
- CARBONTRACKER*, designed to measure reservoir gasses at very low flow rates (Reservoir Characterization)

Well Information

Location Northeast Thailand
 Well Type Vertical (Gas)
 Hole Size 12¼ in. & 8½ in.
 Open Interval Length..... 15,026 ft (4,580 m) MD

The Situation

M-I SWACO provided Managed Pressure Drilling (MPD) services for a land based drilling project for an independent operator in Thailand. This was the first M-I SWACO MPD project in Thailand and the project presented unique challenges, including;

1. Remote drilling location
2. Short delivery time frame
3. The ability to safely handle significant volumes of gas at surface

M-I SWACO designed a fit-for-purpose package that allowed the operator to quickly respond to uncertain downhole pressure environments using proven AUTOCHOKE* technology to safely control and vent any produced gas while controlling bottom hole pressure and without interrupting the drilling process.

The Solution

An MPD equipment suite with the added ability to flow gas while drilling was determined as the best solution for this project.

The MPD equipment, in particular the AUTOCHOKE* technology allowed the client to adjust the effective Mud Weight while drilling in response to the ever-changing downhole pressure environment. This was the most cost effective method to reduce non-productive time (NPT) throughout the drilling of the well.

THE RESULTS

- Increase in ROP (fastest drilled well in the area)
- Substantial reduction in NPT
- Minimized formation damage, with resulting in increase in net present value (NPV)
- Reduced the required number of casing string
- First well in area to utilize water based mud (WBM), K_2SO_4
- Deepest well recorded in Thailand (onshore & offshore), 15,026 ft (4,580 m)

RESERVOIR CHARACTERIZATION

The CARBONTRACKER gas meter makes it possible to measure hydrocarbon gasses at very low rates, while drilling. It will distinguish gas type by its molecular weight. Together with depth and other recorded parameters, sweet spots within the reservoir can be identified and recorded.

SUMMARY

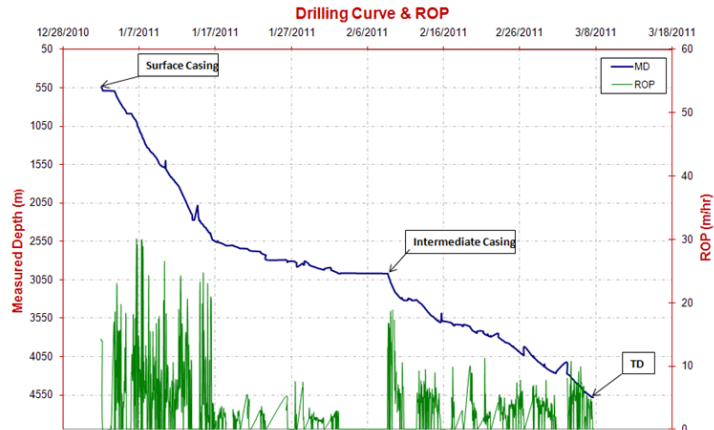
M-I SWACO “fit for purpose” MPD equipment and MPD “know how” and expertise, made it possible for the client to set new benchmarks in Thailand.

Utilizing MPD Techniques allowed this well to be drilled faster while producing gas in a controlled manner, with a reduction in skin damage and NPT which increased the client’s net present value (NPV).

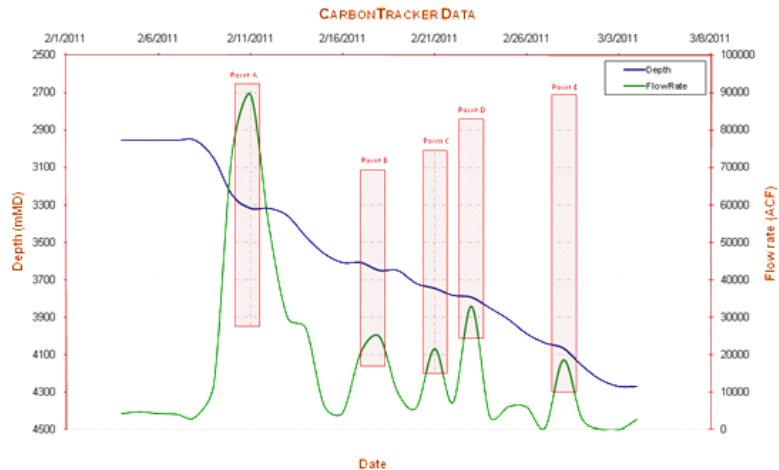
The Results

It can be seen from the Drilling Curve and Reservoir Characterization graphs (below). The success of this operation, with regards to ROP, reduction in NPT and identifying the reservoir “sweet spots” (Reservoir Characterization).

Drilling Curve



Reservoir Characterization



Questions? We'll be glad to answer them.

If you'd like to know more about our Managed Pressure Drilling products and how they are performing for our other customers, please call the M-I SWACO office nearest you

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