

PROJECT:

Deepwater Drilling in Gulf of Mexico.

CHALLENGE:

To optimise downhole sampling programme.

SOLUTION:

By assessing formation fluid composition with FLAIR we were able to determine zones of interest and reduce the number of wireline runs.

BENEFITS FOR CLIENTS:

- Early information, interpretation and analysis,
- Combined cost reduction totalling US\$ 5.9M,
- Field development fluid identification,
- Operational risks reduced.

FACTS:

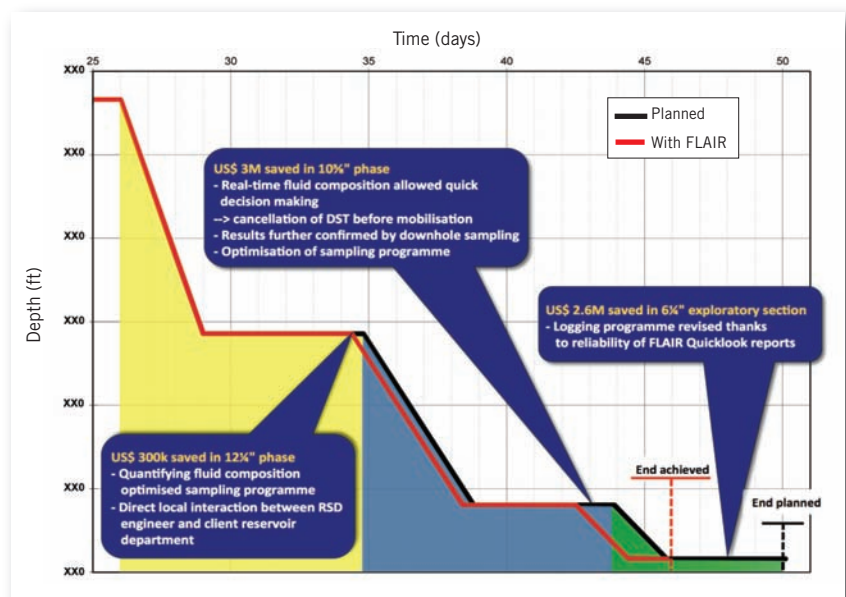
- “FLAIR C1-C5 equivalent to PVT in Real Time” (SPE 109861).

Real-time fluid information saves \$5.9M in the Gulf of Mexico

A recent job with the FLAIR service on a deepwater well in the Gulf of Mexico helped our client optimise his drilling plan.

■ **The added-value information from the FLAIR service was beneficial at each drilling phase of the well:**

- US\$ 300k saved thanks to an **optimised sampling** programme in the 12¼" phase.
- US\$ 3M saved thanks to **quicker decision making** in the 10½" phase: the real-time information on fluid composition revealed different fluid types (confirmed from downhole sampler readings) enabling our client to make quick changes to the action plan.
- US\$ 2.6M in savings were made thanks to **last minute revisions in the logging programme** in the 6¼" **exploratory section**.



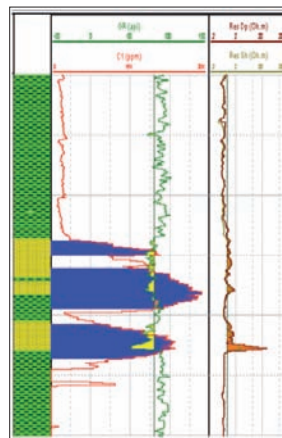


Quantifying fluid composition is Key. Timely use of this information is Key. FLAIR delivers both.

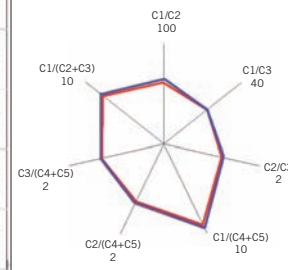
Information provided by FLAIR, downhole fluid analysis (DFA) and fluid analysis data (PVT) are in agreement with one another, thus reducing uncertainties.

12¼" Phase

FLAIR fluid composition used to determine the best sampling intervals.



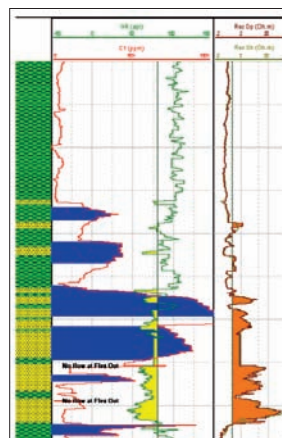
- ▶ FLAIR composition in agreement with Offset Well PVT
- ▶ Number of downhole fluid sampling runs reduced



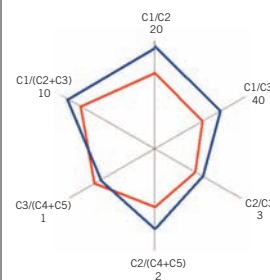
| | Offset Well PVT | FLAIR Current Well |
|-----|-----------------|--------------------|
| C1 | 87,7 | 88,5 |
| C2 | 2,9 | 2,6 |
| C3 | 3,2 | 2,9 |
| iC4 | 0,8 | 1,0 |
| nC4 | 2,2 | 2,1 |
| iC5 | 1,9 | 1,8 |
| nC5 | 1,3 | 1,1 |

6¼" Phase

Fluid information from FLAIR in the current well indicated a different reservoir compartment compared to the Offset Well.



- ▶ No agreement between FLAIR composition in the current well and the Offset Well PVT
- ▶ Open hole logging run revised based on FLAIR data



| | Offset Well PVT | FLAIR Current Well |
|-----|-----------------|--------------------|
| C1 | 77,7 | 84,9 |
| C2 | 7,3 | 3,8 |
| C3 | 6,6 | 4,9 |
| iC4 | 1,2 | 1,0 |
| nC4 | 3,6 | 2,6 |
| iC5 | 1,5 | 1,5 |
| nC5 | 2,1 | 1,3 |

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Information at the right time:

- 1 Obtain formation fluid composition in the **C1-C5** range
- 2 Quick look sent to our client (on a **Daily Basis**)
- 3 **Daily interpretations** made by RSD (Remote Service Delivery) engineers in town
- 4 End of phase, **complete report** delivered **before logging**

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