

REALology Intelligent Drilling Fluids Monitoring System

Case Study: Application in Gas Influx Management

OVERVIEW

- Operation Block: COSL North Sea
- Well Name: XX-Offshore platform XXX-1-A3
- Drilling Fluid: WBM
- Operation Time: November 2024
- Application Interval: 8-1/2" Section

CHALLENGES

- Drilling in the target zone at 5,100m depth with high-density 2.34 SG mud, encountering gas influx with narrow safety window
- Limited space at the fluid inlet/outlet points required continuous manual monitoring of drilling fluid properties
- Mud engineers faced high workload, maintaining total pit fluid properties while performing continuous measurements

SOLUTIONS

While drilling in the target zone, active gas influx caused significant density fluctuations. The mud engineers were unable to effectively manage both mud weighting operations and the required frequent monitoring mud properties. This led to high operational strain and incomplete characterization of the actual downhole fluid conditions. After deploying the REALology Intelligent Drilling Fluid Monitoring System, continuous real-time tracking of both inlet and outlet fluid parameters was achieved. The system promptly detected abnormal data trends and provided early warnings of potential issues, reducing associated well control risks.

- Significantly reduced crew workload and minimized human error risks caused by physical fatigue
- Modular, compact design adaptable for installation in the limited space of most offshore platforms
- Enhanced accurate, real-time grasp of drilling fluid performance for decision-makers, supporting data-driven optimization



Fig1. The deployed REALology Intelligent Drilling Fluids Monitoring System

RESULTS

The deployment of the REALology Intelligent Drilling Fluid Monitoring System enabled effective monitoring of potential well control risks arising from changes in drilling fluid density during this target zone drilling operation.

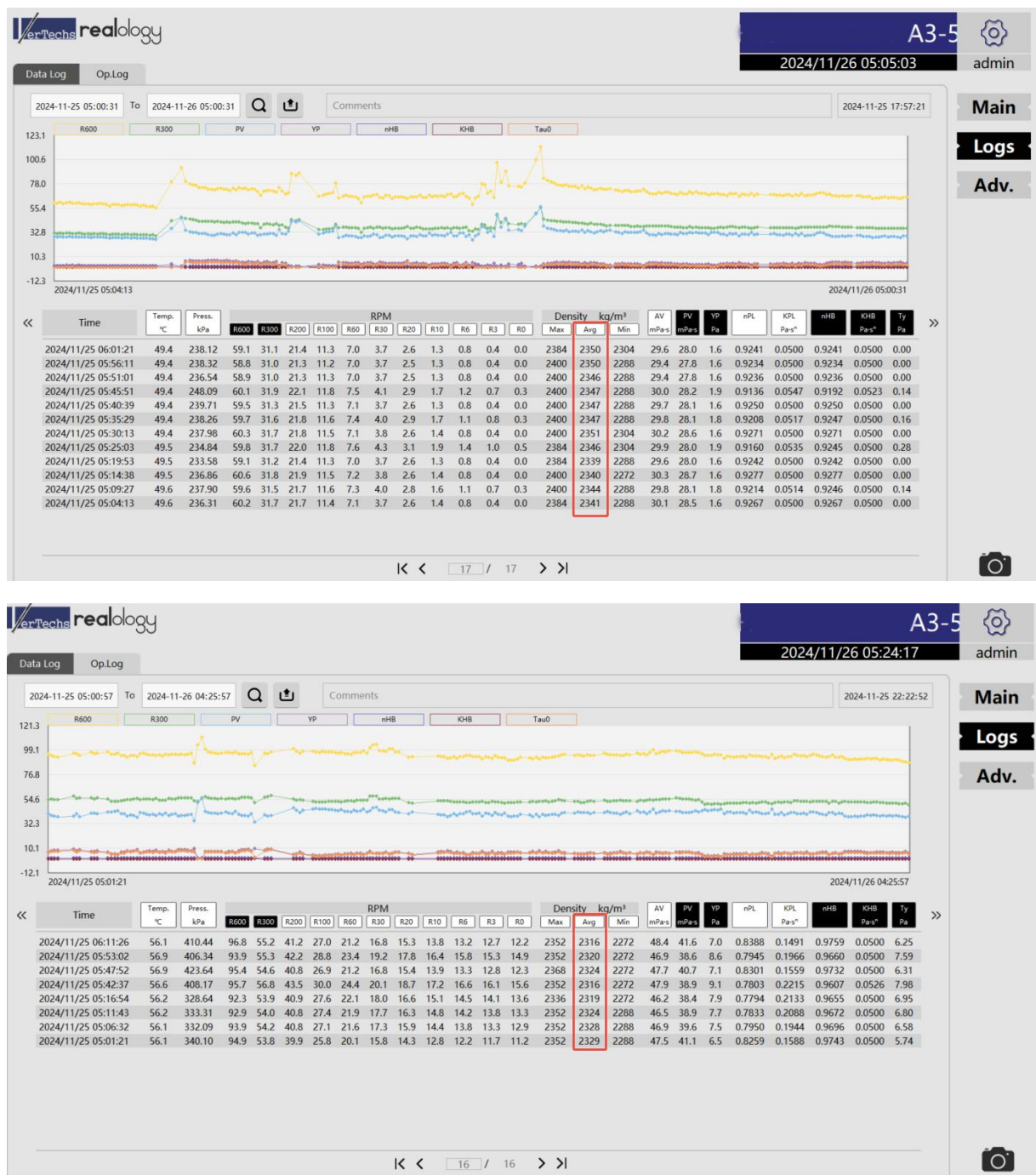


Fig2. Real-Time Density Comparison: consistent inlet density vs. declining outlet readings confirming active gas influx

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