

Torrential Unit Increases Filtration Efficiency by 47% and Extends Online Filtration Time More Than 200%

High-flow filtration improves capacity, reduces HSE risks, and lowers rig time and costs in the Gulf of Mexico

CHALLENGE

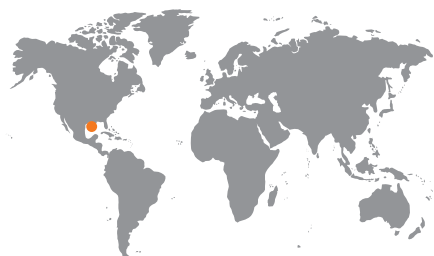
Reduce rig time by increasing continuous filtration circulation rate while improving filtration effectiveness.

SOLUTION

Use the Torrential* high-flow filtration unit to enhance filtration velocity throughput, extending online filtration cycle time, minimizing HSE risks, and reducing costs.

RESULTS

- Increased optimum processing flow rates from 630 galUS/min [2.38 m³/min] to 1,092 galUS/min [4.13 m³/min].
- Completed the process in a single pass, improving filtration efficiency by 47% above standard filtration.
- Sustained processing efficiency 200% above standard filtration.
- Reduced completion fluids displacement transition by 1 hour 28 minutes.
- Diminished particulates (solids loading) from 6% vol/vol to 0.001% vol/vol.
- Reduced nephelometric turbidity unit (NTU) readings from 325 to 6 NTU.
- Lowered costs related to processing.



Overcome limited flow capacities to mitigate HSE risks and reduce rig time

An operator wanted to reduce the cost and effort of clear-brine completion fluids filtration. Generally, typical filtration systems have limited online processing capability. Processing rate inefficiencies are the single major limiting factor of cost control when used on deepwater rigs. The operator needed to mitigate or eliminate these complications to successfully achieve their objective.

Deploy a Torrential unit to increase filtration capacity and mitigate costs and risks

M-I-SWACO, a Schlumberger company, proposed installing a Torrential unit on an offshore rig over a well in the Mississippi Canyon, Block 822. The unit is a diatomaceous earth (DE) filtration system engineered as a two-part upper and lower stack installation. Each unit is a skid-mounted self-contained filtration module. The standard configuration includes 6-in piping and a baseline filtration surface area of 2,200 ft² of DE.

Reduced displacement process time, costs, and effort while mitigating HSE risks

The Torrential unit increased the sustainable process flow rates by 47% above standard filtration equipment. The best performance of standard equipment being only 630 galUS/min [2.38 m³/min], the Torrential unit continually processed 13-ppg [1.55-sg] CaBr₂ brine at a rate of 924 galUS/min [3.5 m³/min]. In total, 189,000 galUS [715.44 m³] was processed without requiring any shutdown to replace the diatomaceous earth filter bed. This exceeded the optimum performance of typical displacement services.



The Torrential unit filtered 4,600 bbl of clear-brine completion fluid in 4 hours—a 47% improvement over standard filtration equipment.