

Germany: VERTI – G configuration slashes costs, losses of VERSACLEAN fluid

“By using the VERTI– G* cuttings dryer system, the operator was able to successfully recover a considerable volume of VERSACLEAN* fluid, reducing both costs and environmental impact.”

Michael Brehm, M-I SWACO Project Engineer



THE PROBLEM

Costs and environmental problems are increased when substantial volumes of oil-on-cuttings (OCC) are lost because of ineffective base fluid recovery and recycling systems.

THE SITUATION

An operator in the South Oldenburg area of Germany had used the VERSACLEAN oil-based drilling fluid to mitigate drilling problems in Lias formation. Unfortunately, about one-third of the total delivered volume of mud was lost to the formation and shaker cuttings while drilling the formation. Using an additional shaker proved to be cost prohibitive and ineffective.

THE SOLUTION

M-I SWACO recommended the operator employ a specially engineered VERTI - G cuttings dryer system to recover and return a large percentage of invert emulsion mud to the active drilling fluid system.

The Situation

To prevent drilling- related problems in the Lias formation, the operator for long had been employing the VERSACLEAN oil-based drilling fluid in the South Oldenburg area of Germany. Historically, about one-third of the total delivered volume of mud was lost to the formation and shaker cuttings while drilling the formation. Consequently, in later wells the operator used an additional shaker for dehydration with the aim of separating mud from the cuttings and returning it to the active system. Unfortunately, using the additional shaker not only proved economically prohibitive, but a considerable volume of oil was still lost through the cuttings. Thus, the operator requested a new concept or technology that would result in performance that was more cost-effective than using the additional shaker.

The Solution

M-I SWACO recommended the operator employ a specially engineered VERTI - G cuttings dryer system designed to recover and return a large percentage of invert emulsion mud to the active drilling fluid system that otherwise would be lost as a waste product. The VERTI – G Separates the cuttings from the shaker and reduces oil-on-cuttings (OCC) percentage using centrifugal forces (300 `G` with 800 rpm). The system employs a flushing system on top of the dryer to prevent the buildup of solids in the recovery area and minimize shutdowns for cleaning. The configuration selected for the South Oldenburg project comprised the dryer, an auger cuttings conveyance system, a processor tank, a centrifuge and pumps.

The objectives of the operation were to reduce as low as possible the percentage of oil-on-cuttings (OCC), thus minimizing the environmental footprint, and to reduce costs through higher recovery and recycling rates.

THE RESULTS

- Recovered 62.6 m³ of base oil from cuttings
- Saved operator 14% in oil-base mud costs
- Reduced disposal costs by 13%
- Minimized environmental impact
- Reduced liquid effluent percentage

The Results

Use of the VERTI - G cuttings dryer system recovered more than 62.6 m³ of reusable oil from cuttings, resulting in a 14% cost savings in oil-base mud (OBM) and a 13% reduction in disposal costs. In addition, the reduced volume of waste reduced the environmental footprint appreciably. Additional cost reductions are possible with the addition of a shaker. For this project, the increasing volume of dry cuttings temporarily allowed only two shakers to be run over the VERTI – G.

Summary

The targeted zones of the South Oldenburg project were the Upper Chalk, Lower Chalk, Jura, Lias and Keuper formations, comprising marlstone, claystone, shale and sandstone. The operator ran a 16-in. bit to drill the intervals from 453 to 2158 m (1486-7080 ft). The 16-in. hole was drilled casing-to-casing in 124 ½ hrs at an average ROP of 13.69 m/h (45 ft/hr) with 4 to 18 tonnes weight-on-bit (WOB) and a pump rate of 3000-3800 l/min.

At spud in, the VERTI – G was adjusted to 890 rpm, producing extremely dry cuttings, which eventually blocked the auger. After the system was cleaned, drilling continued uneventfully to 1200 m (3937 ft) at an average ROP of 20 m/hr (66 ft/hr) where the dry solids blocked the auger beneath the dryer. One shaker was removed and drilling continued problem-free to section TD of 2158 m (7080 ft). The VERTI – G was in operation for a cumulative 123 hrs.

Furthermore, a particle size distribution (PSD) analysis of samples taken from the liquid phase overflow of both the VERTI – G and centrifuge were examined on fine solids (especially the range </= 5,69 mic). The results of the analysis showed: Effluent of VERTI – G: 25 – 30 %; Effluent of centrifuge: 50 – 60 %. The end result was an 8 % savings in the volume of OBM used and a 7% reduction in the volume of cuttings earmarked for disposal.

Questions? We'll be glad to answer them.

If you'd like to know more about the VERTI – G technology and how it is performing for our other customers, please call the M I SWACO office nearest you.



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