

“An international operator successfully used the ULTRADRIL system to drill an intermediate well section in the Cuu Long Basin offshore Vietnam. The ULTRADRIL system allowed the operator to easily achieve drilling targets with significant improvement over other water-base mud systems.”* F. Huadi, Operation Engr. – Tech Support

Well Information

Location..... Rang Dong Field, offshore Vietnam
 Well type..... Directional
 Interval drilled12¼-in, average section length 1,573 m (5,161 ft)
 Disposal method Discharged cuttings overboard

The Situation

An international operator was drilling a 12¼-in. intermediate section of interbedded sand-silt-shale offshore Vietnam. Drilling in the time-sensitive dispersive Bach Ho formation and Oligocene sequences required a drilling fluid that would allow a rotary steerable mud motor to be used and that would be compatible with other downhole tools and equipment. The project also required a fluid that could help in all aspects of Key Performance Indicators improvement. The drilling fluid had to provide good well-bore integrity while drilling through a time-sensitive and very dispersive shale.

The Solution

The ULTRADRIL system was chosen as a replacement for the previous system because it meets all of the specified criteria.

The Results

The following table shows how the ULTRADRIL system contributed significantly to KPI improvement while drilling the 12¼-in hole section of a number of offshore wells between 2001 and 2004.

Average of	2 wells	7 wells	4 wells ¹	5 wells
Mud Type	GLYDRIL*/PHPA	SILDRIL*	ULTRADRIL E-08P exclude	ULTRADRIL E-08P include
Section Length, m (ft)	1,075 (3,527)	1954 (6,411)	1573 (5,161)	1789 (5,869)
Days to Drill Interval	10.75	13.53	6.90	8.72
Mud Cost % of Interval Cost	10.37	7.48	19.28	19.07
12 ¼-in. interval, m/day	100.12	154.53	230.80	217.80
Cost/m	\$1,165.36	\$1,038.62	\$999.35	\$1,032.77
Bit Runs	3.5	4.14	1.25	1.8

¹ Note: Lost circulation into top of basement while drilling well RD-E-08P. Followed by stuck pipe and sidetracking well.

The Details

In the past, KCl/PHPA/glycol and sodium silicate mud systems were used to drill the 12¼-in hole section. Though the systems could provide excellent shale inhibition, there were compatibility limitations to downhole tools and other surface equipment, which meant that the process of KPI improvement could not be optimized properly.

Intensive laboratory tests using shale cuttings from one of the wells showed the ULTRADRIL system to be the best candidate for the job. The ULTRADRIL system was chosen for what would be its first field trial in the Asia-Pacific region on the RD-E-07P Miocene well. To date, nine wells (six basement wells and three Miocene wells) have been drilled using the ULTRADRIL system.

ULTRADRIL Formulation: <ul style="list-style-type: none">• Seawater as required• 1.0 lb/gal Soda Ash• 10% w/w KCl• 3% v/v ULTRAHIB*• 3.5 lb/gal ULTRACAP*• 1.5% v/v ULTRAFREE*• 1.5 lb/gal FLO-VIS PLUS• 2.5 lb/gal FLO-TROL• Barite for density• SAFE-CARB* for bridging	Mud Properties: <ul style="list-style-type: none">• Fluid density 1.2-1.35 sg• Plastic viscosity 20-35 cP• Yield Point 30-50 lb/100 ft²• 6 RPM dial reading 14-20• API FL 3-4 mL• pH 9.0-9.5• MBT 5.0-10.0 lb/gal• Drill Solids <5.0 % <p><u>Note:</u> Flow rate between 850 and 1,000 gpm; 210-mesh DURAFLO* XR* screens installed on all four shakers.</p>
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Approximately 1,500 barrels of mud volume were salvaged, stored in a supply boat for up to two months, and reused on the next well. The salvaged mud was treated with 3-4 gallons of SAFE-CIDE* per 100 barrels of mud prior to being pumped to the supply boat.

The ULTRADRIL system allowed the wells to be drilled an average of 2.2 times faster than the average achievable meters per day using the KCl/PHPA/glycol system.

Questions? We'll be glad to answer them.

If you'd like to know more about the ULTRADRIL system and how it's performing for our other customers, please call the M-I SWACO office nearest you.

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