CASE STUDY

GLYDRIL-IDCAP D System Successfully Drills Reservoir, Offshore Vietnam

"The GLYDRIL*-IDCAP* D system was used to successfully drill an 8 ½-in. horizontal reservoir section, offshore Vietnam as programmed. The well was completed open-hole with a stand-alone sand screen."

F. Huadi, Operations Engineer – Tech Support

Well Information

Location ..... Rang Dong Field, Offshore Vietnam
Spud/completion ..... August 2004
Interval drilled ..... 8 ½-in. horizontal hole for a total of 433 m (1420 ft) – from 2410 to 2843 m (7907 to 9327 ft)
Disposal method ..... Discharged cuttings overboard

The Situation

Wells in the Rang Dong Field have produced a significant amount of sand during the last few years from a reservoir of inter-bedded sand-silt-shale. The formation has up to 30% clay minerals content with wide ranging permeability and sand particle size. A sand control screen is required to prevent sand production.

The Solution

An inhibitive water-base reservoir drill-in fluid (RDF) was needed to drill the reservoir section to minimize sand screen plugging resulting from clay swelling and dispersion, as well as provide good hole integrity. The GLYDRIL-IDCAP D system was chosen since it could provide good inhibition while maintaining good filtercake cleanup efficiency using 10% HCl. From 40 to 50 lb/bbl (114 to 143 kg/m^3) sized calcium carbonate was used to minimize invasion and formation damage. RDF quality control checks were routinely performed aboard the rig while drilling the reservoir section.

The Results

The system performed as expected, with a total of 433 m (1420 ft) of reservoir horizontally drilled with no hole-related problems. The operator achieved the expected production rates and proclaimed the well a 100% success.

The Details

Extensive laboratory testing was performed prior to the drilling and completion of the well. Shale inhibition and solids contamination tests were done at the M-I SWACO Regional Laboratory in Jakarta. Filtercake cleanup efficiency was evaluated and extensively tested at Constien & Associates Laboratory in Oklahoma, USA.

The GLYDRIL-IDCAP D system was chosen since it could provide good shale inhibition while maintaining good filtercake cleanup efficiency with 10% HCl. A total of 433 m (1420 ft) of reservoir section was drilled with no hole-related problems.

The initial dilution rate was 1.65 bbl/m (0.50 bbl/ft) drilled. The dilution rate was increased to 3.0 bbl/m (0.91 bbl/ft) drilled during the last 140 m (459 ft) because the formation being drilled was primarily siltstone. Dumping and dilution were performed simultaneously to keep the fluid properties within specification.

Although four VSM shakers, dressed with 185-mesh DURAFLO* screens, were available, only two were used while drilling the reservoir section. These two shakers could handle a 600-gpm flow rate.

A 1.15-sg (9.6 lbm/gal) filtered KCl brine was used as a completion fluid. The sand screen was set in place as programmed. Filtercake cleanup was performed twice with a 10% HCl solution. A 1.03-sg (8.58 lbm/gal) filtered KCl brine was used as a packer fluid.

RDF Formulation:		**RDF Properties:**	
• Drill water as required		• Fluid density	1.17 – 1.18 sg
• Soda ash	0.5 lb/bbl	• 6-rpm dial reading	11 – 14
• KCl	10% w/w	• API FL	3 – 4 mL
• GLYDRIL MC	3% v/v	**QAQC checks (every 2 – 3 hours):**	
• IDCAP D	3.0 lb/bbl	• Drill solids	max 1.6%
• FLO-VIS* PLUS	1.5 lb/bbl	• MBT	max 1.25 lb/bbl
• FLO-TROL*	7.0 lb/bbl	• $CaCO_3$	47 – 55 lb/bbl
• SAFE-CARB* 2 - 10.0 lb/bbl, $CaCO_3$ Fine -25 lb/bbl and SAFE-CARB 20 - 25 lb/bbl		• PPA test using 35µ ceramic disk (500 psi @ 200°F)	
Dilution: $CaCO_3$ F- 30 lb/bbl & SAFE-CARB 20 - 30 lb/bbl		• Spurt loss	1.2 – 2.4 mL
		• Actual 30-min	5.0 – 8.6 mL

Questions? We'll be glad to answer them.

If you'd like to know more about the GLYDRIL-IDCAP D system for Reservoir Drilling Fluid applications and how it's performing for our other customers, please call the M-I SWACO office nearest you.

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