

# WELL COMMANDER valve controls mud losses, saves Brazil operator \$1 million

“The client approved use of the WELL COMMANDER\* tool on the mutual understanding it would be of a trial nature. Over the next few days the client found the tool to be highly effective in dealing with mud losses in the well.”

Alex Drennan Area Manager ABBC M-I SWACO

## Well Information

Location .....	Offshore Brazil
Spud Date .....	February 2011
Hole size .....	8 ½ in.
Hole angle: .....	Vertical
Total Depth.....	2,970 m (9,742 ft)
Drilling Fluid.....	9.0 lb/gal (1.08 s.g.) low-solids polymer WBM

## The Situation

Offset well data suggested the operator could expect lost circulation problems while drilling the 8 ½-in. interval. Controlling losses would require coarse lost circulation material (LCM) treatments. The operator required a method of placing these treatments that would not affect the directional drilling equipment in the bottom hole assembly.

## The Solution

A 7-in. OD WELL COMMANDER tool, complete with back-up and relevant ball catcher, was recommended to be used in the drillstring to provide an alternate circulating path around the bottomhole assembly. The client agreed to try the WELL COMMANDER tool on a trial basis.

## The Results

While drilling the 8 ½ in. interval, losses were encountered at two different depths. Each time the WELL COMMANDER valve was opened and the bottomhole assembly was isolated before pumping 100 bbl (15.9 m<sup>3</sup>) coarse LCM treatments. Losses of 600 bbl/hr (95.4 m<sup>3</sup>/hr) and 300 bbl/hr (47.7 m<sup>3</sup>/hr) were reduced to 50 bbl/hr (7.95 m<sup>3</sup>/hr) and 30 bbl/hr (4.8 m<sup>3</sup>/hr), respectively. Once losses were reduced to these acceptable levels, drilling proceeded without the expensive time consuming trips used on the offset project. The WELL COMMANDER tool saved 24 hours or \$300,000 of non-drilling time/cost and over \$700,000 in lost mud that would have been consumed making two round trips to address lost circulation problems. In addition, the WELL COMMANDER valve was opened prior to tripping out at total depth to increase annular velocities for enhanced hole cleaning. The tool was closed prior to tripping out.

During the drilling of the section both primary and back up tools were used. They were changed out as a precautionary measure only at bit change intervals. The client found the tool so invaluable that it will be used in every viable drilling BHA within the tool's size configuration. After this job, the client asked to have two 7 in. and two 8 ¼ in. tools designated to its operations on a long-term rental basis.

## The Details

The WELL COMMANDER tool was placed in the 8½ in. drill string above the BHA and 234 m (768 ft) above the bit, which was as close as possible to the BHA while staying within the compression limits of the tool. The more sensitive parts of the directional BHA, MWD, rotary steerable and mud motor were combined with drill collars and jars. The insert roller cone bit was dressed with three 16/32 in. nozzles. The hole angle was vertical. The WELL COMMANDER valve was run into the hole when drilling of the 8½-in section commenced at 2,145 m (7,036 ft). At 2,882 m (9,453 ft) the well started taking losses, initially at an acceptable rate, but then increasing to 600 bbl/hr (95.4 m<sup>3</sup>/hr).

The WELL COMMANDER tool was opened as per operating parameters and afterwards a BHA shut-off ball was dropped to completely isolate the lower assembly from fluid circulation. A 100 bbl (15.9 m<sup>3</sup>) coarse LCM pill consisting of 41 lb/bbl (117 kg/m<sup>3</sup>) of blended calcium carbonate from fine to coarse and 10 lb/bbl (28.5 kg/m<sup>3</sup>) of coarse loss prevention material was pumped via the WELL COMMANDER valve ports into the loss zone. This treatment reduced the loss rate from 600 bbl/hr (95.4 m<sup>3</sup>/hr) to 50 bbl/hr (7.95 m<sup>3</sup>/hr). At this point the client deemed loss rates to be acceptable, prompting the second activation ball to be dropped to close the WELL COMMANDER tool and allowing drilling to continue. The next day at 2,921m (9,580 ft), the rig again encountered losses - this time at 300 bbl/hr (47.7 m<sup>3</sup>/hr). Once more, the WELL COMMANDER tool was opened and a BHA shut-off ball was dropped to protect the lower BHA internals while another 100 bbl (15.9 m<sup>3</sup>) coarse LCM pill consisting of 41lb/bbl of blended calcium carbonate from fine to coarse and 10 lb/bbl (28.5 kg/m<sup>3</sup>) of coarse loss prevention material was pumped. This treatment resulted in loss rates declining from 300 bbl/hr (47.7 m<sup>3</sup>/hr) to 30 bbl/hr (4.8 m<sup>3</sup>/hr). Drilling continued and TD was reached at 2,970 m (9,742 ft) without encountering further losses.

Since this was this client's first application with the WELL COMMANDER valve, a M-I SWACO Specialized Tools engineer was sent to the rig to familiarize the crew and client representatives with the tool. In the future, it is expected the rig crews will run the tool due to the comparative simplicity of its operation. The job turned out to be a textbook execution.

## Ball Drop Record

Ball Number	Ball size (In.)	Shear Pressure (psi)	Position	Rate at which ball pumped (bbl/min/)	Operational Requirement	Fluid Type
1	2.125 in.	2100	Open	3 bpm	Open to pump LCM	8.9 ppg WBM
2	2.063 in.	N/A	Shut off	5 bpm	To isolate BHA from LCM	9.0 lb/gal LCM
3	2.125 in.	2100	Closed	3 bpm	Close to continue drilling	8.9 lb/gal WBM
4	2.125 in.	2300	Open	3 bpm	Open to pump LCM	8.9 lb/gal WBM
5	2.063 in.	N/A	Shut off	5 bpm	To isolate BHA from LCM	9.0 lb/gal LCM
6	2.125 in.	2500	Closed	3 bpm	Close to continue drilling	8.9 lb/gal WBM
7	2.125 in.	2500	Open	3 bpm	Open to boost AVs prior to POOH	8.9 lb/gal WBM
8	2.125 in.	2500	Closed	3 bpm	Close to POOH	8.9 lb/gal WBM



<b>BHA 1 (Page 1):</b>
Well commander
<b>M-I SWACO JOB NUMBER:</b>
<b>SCHEMATIC BY:</b>
Alex Drennan
<b>OPERATOR:</b>
<b>AREA/REGION:</b>
Brazil
<b>WELL FIELD &amp; NUMBER:</b>
<b>PROJECT NAME:</b>
<b>REVISION:</b>
0
<b>DATE:</b>
17 Feb 2011
<b>APPROX. SHIP DATE:</b>
<b>WORKSTRING PROVIDER:</b>
<b>OCS-G:</b>
<b>SALES CONTACT:</b>
<b>ENGINEER:</b>
<b>MAXIMUM ANGLE:</b>
10 degrees
<b>RIG:</b>
<b>RIG PHONE:</b>
<b>DISPLACEMENT TYPE:</b>
<b>INITIAL FLUID:</b>
<b>COMPLETION FLUID:</b>
<b>SPECIAL BILLING / COMMENTS:</b>

Casing	Description	OD (in)	ID (in)	Tool Length (ft)	Depth from Top of Tool (ft)	Depth from Bottom of Tool (ft)
9.625" Production Casing 47.00 ppf I.D. 8.681" Drift 8.525" 0.00 - 7066.93 ft	5,000", 19.50# Workstring w/ NC-50 (Box up)	6.625	0.000	8826.09	0.00	8826.09
Open Hole 7066.93 - 9744.09 ft	HWPIPE NC-50 (Box)	6.500	3.000	183.79	8826.09	9009.88
	WCMD (WCMD CUSTOM)	7.000	2.000	4.59	9009.88	9014.47
	BBC (BBC CUSTOM)	7.000	1.985	5.12	9014.47	9019.59
	8.500" DCOLLAR (DCOLLAR CUSTOM)	0.000	3.000	30.00	9019.59	9049.59
	JAR	6.500	2.500	34.58	9049.59	9084.17
	18 x DCOLLAR	6.500	2.875	541.63	9084.17	9625.80
	MagTrak, MWD Stab, Sub Float, Filter sub.	6.500	3.250	47.64	9625.80	9673.44
	BCPM	6.750	2.167	10.40	9673.44	9683.84
	MWD STAB	8.375	2.250	4.27	9683.84	9688.11
	On Trak	6.750	2.250	16.70	9688.11	9704.81
	Co Pilot	6.750	2.250	7.32	9704.81	9712.12
	TruTrak	6.750	3.000	30.97	9712.12	9743.09
	DB (DB CUSTOM)	0.000	0.000	1.00	9743.09	9744.09

**Questions?**

If you'd like to know more about our WELL COMMANDER tool and other tools for Drilling and Wellbore Clean Up operations, please call the M-I SWACO office nearest you.



P.O. Box 42842  
Houston, Texas 77242-2842  
www.miswaco.slb.com  
Email: questions@miswaco.slb.com

This information is supplied solely for informational purposes and M-I SWACO makes no guarantees or warranties, either expressed or implied, with respect to the accuracy and use of this data. All product warranties and guarantees shall be governed by the Standard Terms of Sale. Nothing in this document is legal advice or is a substitute for competent legal advice.