



PERFORMANCE BULLETIN

DSI PBL Bypass System allows pumping High Concentration LCM (760 Kg/m³) in an Offshore Exploration Well in Mexico.

Challenge

The DSI PBL circulating sub was requested by a major operator in Mexico to be utilized in a 18-1/4" hole diameter and directional BHA with RSS, MWD, PWD and sonic logging tools as a contingency for total or partial mud loss in an offshore exploratory well. The density fluid program was to start from 1.35 g/cc at 1200 m and gradually increase it up to 1.65 g/cc at 2,900 m).

Solution / Execution

At 1,582 m TD with a 1.41 g/cc mud density, a total mud loss was observed with no circulation. The operator decided to activate the PBL sub to pump a pill of 30 m³ with a concentration of 300 kg/m³. The pumping parameters before the PBL sub activation were 460 GPM and 1,090 psi; after the activation ball reached the PBL sub the pressure dropped to 600 psi. The 300 kg/m³ pill was pumped thru the PBL sub and then displaced with drilling fluid at a 1.32 g/cc density. The operator decided to trip out to the casing shoe, but a flow from annulus got inside the drill pipe and then up to the surface (due to mud loss and the fact that annulus fluid density was higher than the fluid density inside the drill pipe (1.41 > 1.32)). In this special case the DSI field operator recommended to deactivate the PBL sub to avoid U tube effect under this special conditions. Two 1-3/4" deactivation steel balls were dropped and after 10 minutes the PBL sub was deactivated successfully at 2,600 psi and then the pressure dropped to 700 psi.

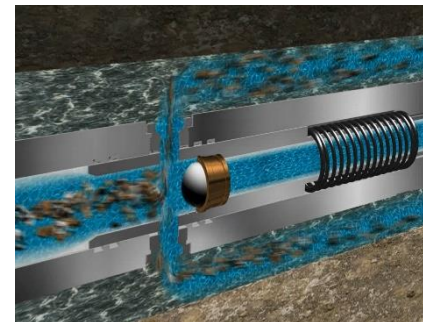
After the first LCM pill, the mud loss was not eliminated and continued at a rate of 64 m³/h losing circulation again. The density was lowered to 1.25 g/cc which made 14 m³ to be returned from the formation. A second **30 m³** pill at a **760 kg/m³** concentration was deployed at 1,570 m thru the 8-1/4" PBL sub. A 2-1/2" activation ball was dropped at 413 GPM and 957 psi. After activation, the pressure dropped to 398 psi. The pill was settled at the hole bottom and the PBL sub was successfully deactivated by dropping two 1-3/4" steel balls that made pressure reach 2,800 psi and then drop down to 360 psi. After this LCM pill was pumped, the mud loss was eliminated. Successful functional test for MWD and directional BHA was performed at different flow rates to confirm deactivation of the PBL sub.

Conclusion & Recommendation

- Multi-activation of PBL sub allows pumping aggressive LCM concentrations; in this operation up to 760 kg/m³.
- The PBL sub protects directional drilling tools even when high LCM pills are deployed.
- Reduce rig time by activating the PBL tool, no need to do round trips and lose mud during all trips.



Drilling operations in exploration wells in Mexico are always challenging. DSI PBL multiple activation bypass tools help to successfully overcome these challenges.



Deployment of aggressive LCM pills thru DSI PBL tool represents a significant cost reduction to drilling companies and operators.

For total losses during drilling operations, the use of DSI PBL tool allows the Operator to pump aggressive LCM pills to:

SAVE rig time,
PROTECT directional BHA,
ELIMINATE round trips,
REDUCE drilling fluid costs due mud losses.

**BYPASS SYSTEMS
BY DSI**