

Lost Circulation Materials

Hesitation squeeze with STEELSEAL®/BARACARB® LCM pill stops losses and strengthens wellbore in production interval

Location: Gulf of Mexico

Overview

When drilling began in the production interval on a deepwater development well, the operator encountered lost circulation at a rate of 15-bph. The formation integrity test (FIT) had not yet been conducted. The drilling fluid in use was a 14.2-ppg synthetic-based mud (SBM). The density was decreased to 13.8-ppg, but losses continued at 2-bph. In order to drill ahead, the operator needed to achieve a FIT equivalent to 14.6-ppg. This problem had not been encountered on other wells in this field.



SAVED CUSTOMER
4 DAYS
OF RIG TIME

HAL41083

\$4 MILLION
ESTIMATED SAVINGS



Solution

As part of the Baroid team’s lost circulation mitigation strategy, a customized high-concentration lost circulation material (LCM) pill had been prepared on surface and was ready for deployment. The 100-bbl pill consisted of the STEELSEAL® “Engineered, Composite Solution” and BARACARB® sized ground marble. This proactive approach helped save the rig critical path time required for responding to a loss situation.



HAL40609

Baroid develops customized solutions to address customers’ specific needs.

CHALLENGE	SOLUTION	RESULT
Lost circulation occurred at the outset of drilling the production interval, prior to conducting a formation integrity test (FIT). In order to drill ahead, the operator needed to achieve a FIT equivalent to 14.6-ppg.	A pre-mixed LCM pill comprising the STEELSEAL® “Engineered, Composite Solution” and BARACARB® sized ground marble was spotted, and a hesitation squeeze was applied to strengthen the wellbore.	Losses were stopped, and the operator was able to achieve the 14.6-ppg FIT result needed to reach the target depth.

Baroid personnel recommended using the 70-ppb pre-mixed pill to perform a hesitation squeeze. The LCM pill components are shown below:

LOST CIRCULATION MATERIAL	CONCENTRATION
BARACARB® 25	5 ppb
BARACARB 50	10 ppb
BARACARB 150	10 ppb
BARACARB 600	10 ppb
STEELSEAL® 400	15 ppb
STEELSEAL 1000	20 ppb

The pill was spotted in the open hole, and small hesitation squeezes were performed in 2-bbl increments.

- The pill was pumped through a 10 5/8-in. x 11 3/4-in. drilling bottomhole assembly (BHA) that had 8 12/13-in. bit nozzles and included downhole tools such as pressure-while-drilling (PWD), resistivity, gamma ray, sonic, density, and neutron services.
- The bottomhole temperature of the loss zone was approximately 200°F.
- The hesitation squeeze was completed in only 9.5 hours. Each squeeze cycle included a 2-bbl squeeze and a 20-minute pause.

The operator was able to increase the wellbore stress by 915 psi. Then 10 ft of new formation was drilled and the required FIT of 14.6-ppg was achieved. The production interval was drilled successfully to the target depth (TD) with no additional losses.

Economic value created

The successful hesitation squeeze saved the customer four days of rig time and the cost of performing a cement squeeze, for an estimated savings of over \$4 million. The operator captured this treatment as a lesson learned and has established it as a best practice moving forward.