

Kronos Low ECD Synthetic-Based Mud: 114 Hours Static at 40° Inclination

Deepwater, Gulf of Mexico

Well Information:

Water Depth: 3,800'
MD: 10,135'
TVD: 9,797'
BHT: 115° F
Inclination: 40.73°
Survey Depth: 10,001'

Challenge

A client experienced a total top drive failure while drilling. This led to the drilling BHA and approximately 40 bbls of cuttings (at pumps down) to be suspended in 2,815' of open hole at time of the shutdown.

Solution

Kronos Low ECD SBM at a weight of 10.9 ppg was being utilized during this event. The Kronos system was designed and maintained to have adequate suspension properties to maintain wellbore integrity without sag during unexpected downtime even with cutting left in the hole.

Results

After being static down hole for 114 hours during troubleshooting operations, the Kronos SBM system showed no sag event once ramping up the pumps. All cuttings were circulated out over three bottoms up before pulling out of the hole. No tight spots or torque increase were observed while pulling out of the hole.

While drilling, a top drive failure resulted in shutting down drilling operations at 04:50 in September 2019. The ESD was 11.36 ppg and ECD was 11.5 ppg while drilling with a ROP of 100 fph.

Under Newpark Fluids Systems' recommendation, there was no utilization of the pumps while shut down. This was to lower the chance of packing off the annulus with cuttings until rotating and reciprocating could continue. 100-psi backpressure was maintained using MPD system.

The repairs to the top drive resulted in 5 days with no circulation and the fluid remaining static. At 23:00, September 21 the rig was able to rotate and reciprocate (114 hours static). The pumps were ramped up and cuttings removed from open hole. There was 2,815' of open hole, with approximately 40 bbls of cuttings to remove while shut down.

Once circulating, the ESD was 11.28 ppg and ECD of 11.33 ppg. Mud weight in and out was 10.9 ppg with one increase of weight observed at the shakers of 11.1 ppg approximately a quarter into the first bottoms up. This was the only increase in mud weight with no decreases while circulating. Mud weight maintained 10.9 ppg with no sag indication while using the Kronos Low ECD synthetic-based mud.

A total of three bottoms up were observed before decision was made that the hole was clean. No tight spots or torque increase was observed while pulling out of the hole.

Prior Shutdown Fluid Properties

MW: 10.9 ppg
YP: 23
6 rpm: 18
3 rpm: 17

Post Shutdown Fluid Properties (Pit):

MW: 10.9 ppg
YP: 24
6 rpm: 17
3 rpm: 16

Post Shutdown Fluid Properties (Flowline):

MW: 10.9 ppg
YP: 22
6 rpm: 15
3 rpm: 14

