

Equinor Saves 24 to 56 Hours on Challenging Well Cleanouts

ACTive Power system eliminates battery changes during extended real-time wellbore cleanout operation, North Sea

Equinor used ACTive Power* CT real-time powered downhole measurements system to save 24 to 56 hours on North Sea well cleanout operations by eliminating battery changes for critical downhole tools.

Equinor's concerns

To effectively clean sand and scale from a well on the continental shelf, coiled tubing (CT) is used to entrain small volumes of fill ("bites") and then deliver them to surface with periodic wiper trips. The downhole tools needed to maximize operational efficiency require power, conventionally delivered from batteries that must be replaced every three to four wiper trips (16 to 26 hours per trip), adding an average of 8 hours per change. In addition, battery efficiency drops at low temperature, so surface delays for weather or other reasons can increase the time required for battery changes before resuming the cleanout operation.

For a CT cleanout in one well that was slated for plugging and abandonment (P&A) and a second well that needed production enhancement, Equinor wanted to minimize job time and costs by eliminating battery changes.

What Schlumberger recommended

ACTive Power CT real-time powered downhole measurements system delivers continuous power from surface through a hybrid cable in the tubing, eliminating the need for batteries to power downhole tools.

Well Cleanout Times							
Well	Fill Length, m	Average Bite Size, m	Time per Trip, h	Max. Wiper Trips per CT Run	CT Runs	Battery Changes	Battery Change Time, h
A	1,000	200	26	3	3	3	24
B	355	150	16	3	2	1	8
C	1,800	100	18	4	7	5	40
D	900	100	21	3	4	2	16
E	1,000	100	28.5	Unlimited	2	0	0
F	3,980	100	22	Unlimited	3	0	0

ACTive Power system saved Equinor an estimated 24 to 32 hours in Well E and 56 hours in Well F by eliminating battery changes in two challenging cleanout operations. Cleanouts in Wells A through D used conventional battery technologies; ACTive Power system was used in Wells E and F.

What Equinor gained

ACTive Power system was first used for a CT cleanout operation on Well E, an oil producer that was slated for P&A. Equinor believed the fill would comprise sand, rocks, and scale covering about 1,000 m in a 40° deviated section just above a suspected liner collapse. Schlumberger ran the ACTive Xtreme* CT real-time rugged downhole measurement tool, powered by the ACTive Power system, with a positive displacement motor (PDM) and polycrystalline diamond compact (PDC) mill bit.

In all, the operation removed 2,960 kg of solids, some of it much larger than expected, in 9 wiper trips and only 2 runs totaling 256.9 hours. Eliminating battery changes in the downhole tools saved the operator an estimated 24 to 32 hours.

ACTive Power system was then deployed with a similar BHA to remove barium sulfate scale from a 3,980-m interval of Well F. The operation removed 28,686 kg of scale and sand in 49 wiper trips with 3 runs totaling 409 hours. With batteries, the job would have required 7 runs, so using the ACTive Power system saved Equinor about 56 hours of operation time.

More technical details

SPE-199873 is scheduled for presentation at the 2020 ICoTA conference in March.