

Coiled Tubing hard scale milling in high temperature well

Downhole turbine motor enables reaching targeted interval

CHALLENGE

Remove hard wellbore deposits to gain access to a new perforating interval in high temperature well.

SOLUTION

Downhole turbine motor (TT Turbodrill) solution:

- High temperature application
- Reduces the size of deposits, allowing efficient clean out without the use of chemicals
- Continuous pumping even if motor stalls
- Much higher RPM than conventional PDM

RESULTS

Successfully reached target depth and confirmed efficiency of Diamond turbine mills.

Hard wellbore deposits obstructing perforating interval

An operator in the Norwegian sector performed bailing operations followed by scale milling with wireline to clean out wellbore deposits to gain access to a new perforated interval.

Limited progress was achieved due to the hardness of the deposit, high temperature ($T = 162\text{deg C}$) and asphaltenes causing WL tools to stick. The maximum depth reached was not considered deep enough to proceed and perforate the intervals originally planned for.

Downhole turbine motor solution in HT well

2-3/8" Coiled Tubing was mobilized to mill hard Barium Sulfate scale to gain access to the intervals to be perforated.

First Run:

- Turbodrill mill run 3.625" OD
- Milled down from 4483m to 4489m. Very slow milling
- No further progress after this depth
- Carbide mill cutters heavily worn on outside 1/3 of face. Confirmed very hard and massive scaling deposits



Before
TT Turbodrill mill before and after first run

Second Run:

- MDX Diamond mill 3.5" OD
- Milled down from 4490m to 4521m
- Target depth reached
- Mill showed very little wear, cutting face still intact. Mill slightly under gauge 3.40" OD.



Before
MDX Diamond mill before and after second run

A successful operation

Because of the nature of the deposit and the high temperature, the CT intervention with downhole turbine motor and diamond mill offered the best solution to achieve target depth.