

CASE STUDY

Country: Norway

Year: 2020

Technologies:

- PowerTrac® PRIME Tractor
- Direct Drive Rotation PRIME
- PrecisionCollector

PRIME Technology enables record breaking e-line deployed PrecisionCollector debris cleanout on a highly deviated North Sea well

- Up to 100 litres of debris collected per individual run.
- High volume collection accomplished – a total of 1400 litres of debris removed.
- High job efficiency achieved – high speed tractor conveyance and real-time chamber full indication.

Challenge

Equinor had a large 7" mono-bore completion which had an extensive amount of produced sand debris accumulated within, debris that was preventing the execution of a required P&A operation on the well. While wellbore cleanout jobs of this magnitude were usually reserved for Coiled Tubing, it was proposed by the Altus team to carry out a high-volume debris cleanout operation using e-line deployed technology, leveraging its light and agile footprint.

Achieving operation efficiency however would require a large number of collection chambers to be deployed, maximizing the debris volume removed per run, and minimizing the time-on-depth during the collection process – all this while maintaining safe rig up/down and deployment of the toolstring into and out of the well.

Solution

Altus Intervention recommended utilizing the capabilities of the new PRIME™ Technology Platform combined with the PrecisionCollector to execute the operation. The PoweTrac PRIME™ tractor would provide efficient high-speed conveyance when deploying the collector string to task depth along the highly deviated section of the well, saving considerable time on what would be a multi-run operation. During the collection phase, this highly instrumented Tractor coupled with the PRIME™ Direct Drive Rotation device would provide a high level of real-time visibility and system synchronized control, maximizing the collection efficiency while minimizing the tool time on depth. System benefits include:

- Real-time weight on bit control, minimizing stall-out occurrence and providing automatic stall recovery
- Continual bit rotation, not only during collection but also during the precautionary back-reaming stages
- Clear indication of exactly when the collection chambers were full of debris

In addition, collection chamber quantity per run in hole would be maximized through the use of a special lifting frame during the toolstring rig-up on the wellhead, providing increased rig up height. Thorough pre-job tests were carried out at the Altus Well Intervention Academy in Stavanger to ensure successful handling of the long toolstring and its in-well debris collection.

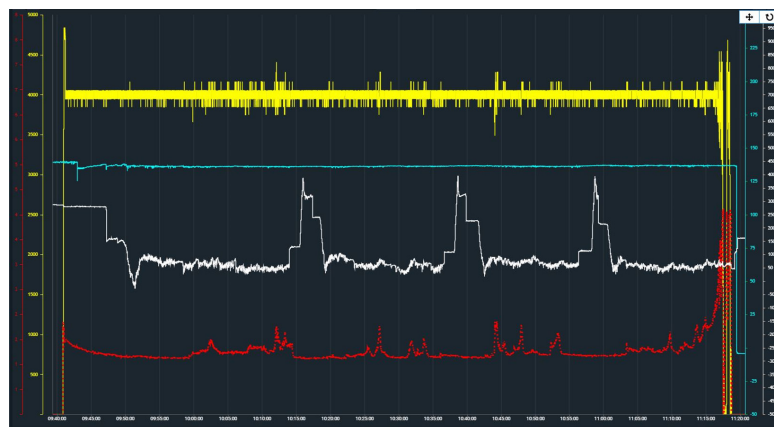
- Safe surface handling and rig-up of a 10-chamber collection toolstring was tested and rehearsed, and procedures defined.
- A 7" tubing was inserted into the Academy's on-site 9-5/8" well to replicate the actual well completion, and 100 litres of sand was introduced and left to settle. Collection tests were then carried out using the actual toolstring, monitoring the critical parameter response in detail throughout.



Results

Wellsite rig-up utilizing a maximum of 10 collection chambers in the toolstring was handled safely and efficiently for all the 20 runs executed, with BHA surface turnaround times between runs in the 2 to 3 hour range. For each run in hole, tractor conveyance over the highly deviated sections of the well reached speeds of over 26 meters/minute. Debris was deposited in the 7" and 4-1/2" tubing sections of the well, requiring both the PrecisionCollector 450 and 350 technology to be utilized. In both cases, debris collection proved highly effective and efficient, with 100% compacted solids consistently recovered during the collection runs – as a result of the robust auger system design. Collection task times per run were 5 hours or less, this efficiency was due to the effectiveness of the collection technology coupled with a clear and immediate "chambers full" indication seen via surface readout in real-time – the latter ensuring there was no excessive and unnecessary time spent on collection, or any premature pulling out of hole which would necessitate additional runs.

The operation resulted in circa 1400 litres of debris being removed from the well, and a depth cleanout of 272 meters, this requiring a total run time of less than 10 days. It was a record-breaking recovery result for e-line deployed wellbore cleanout, one which took this methodology into the realms of coiled tubing territory, and which proved it to be a viable and highly effective option for the customer.



— Tractor Rotation Anchor — Bit RPM — Toolstring Tension/Compression — Bit Torque