

Case Study

HydroFORM™ Centralizers

Friction Reduction in Open Hole Packer Completions

The Challenge

Volant's customer was executing open hole packer completions in a North Dakota shale play. Prior to employing Volant HydroFORM™ Centralizers, the customer had been running packer systems with other centralizers for standoff protection in the open hole section.

The operator encountered running challenges during liner installations and began to revisit drilling, reaming, and running practices to improve success for future wells. During this process the operator considered using alternative centralizers near the packers on the liner.

The Solution

Volant HydroFORM™ Centralizers were chosen to provide standoff protection for the packers, typically running one centralizer with each packer. Packers were spaced approximately six joints apart in the horizontal section. In the first liner run with Volant centralizers, the customer encountered running challenges and the liner was stuck 200 ft short of Total Depth (TD). Volant provided torque-drag modelling and advised on the amount of heavy weight drill pipe needed to improve the chances of reaching TD on the next planned well, reducing their non-productive time.

Torque and drag modelling completed by Volant indicated that the challenge in reaching target depth in the earlier well was due to substantial open hole friction. Future wells with similar profiles and configurations would be expected to encounter similar challenges. Buckling was predicted in the heavy weight drill pipe used to run the liner, and more importantly, in the upper section of the more-compliant liner pipe. Buckling was expected to result in substantial incremental side loading on the liner (and higher running friction), particularly near the heel of the well, where the axial compressive forces are highest. This scenario would result in rapid reductions in available hook load, and ultimately lead to challenges in reaching TD.

The Results

Volant's applications engineering team initially recommended the addition of centralizers in the cased hole (build) section of the planned well in an attempt to mitigate buckling-related drag in that section. Confirming that the customer's planned heavy weight drill pipe configuration should be sufficient to reach TD, Volant recommended that the customer employ one centralizer per joint in the build section to mitigate buckling effects.



Volant's review of the measured surface loads during the successful run led the customer to consider more centralizers in the open hole section for future wells, reducing total friction. On subsequent wells, an additional centralizer was placed at each packer in the open hole section (one on each side of each packer), and the liner runs continued to be smooth with a substantial observed reduction in open hole friction factor of approximately 30%.

While centralizers do not reduce the amount of side load associated with the pipe weight, they can be configured to keep the connections and packer assemblies off the bottom, thus reducing the likelihood of the packers interacting with the cuttings bed. Additionally, in regions where high compression (thrust) loads occur, an optimized spacing of centralizers will tend to reduce the drag associated with buckling-induced side loads in zones of high compression. Robust centralization solutions that help mitigate buckling and reduce side-loads ultimately reduce running friction and increase the chance of successfully reaching TD. This facilitates longer-reach completions with a small incremental investment.



Doing more with less. Drop us a line if you want to know more.

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