

BACKGROUND:

PetroFrac Oil Tools, a PetroQuip Company, created the ShortSTAK Flapper Composite Frac Plug to provide operators with a new way to reduce their frac pumping and milling time thus improving operational efficiencies. Special attention was focused on the installation process to reduce the risk of misruns. The ShortSTAK frac plug is significantly shorter than conventional frac plugs, just 7 inches in length, and has a fully composite patent-pending design.

CHALLENGE:

In Q1 2018, an operator in the Irion County of the Permian Basin wanted to use the ShortSTAK frac plug as an option to drive down costs, reduce the risk of misruns, improve operational efficiencies and reduce water usage. The opportunity to run the plug in a 22,300-ft. horizontal well provided the ideal test.

PROCESS:

PetroFrac worked with an operator to deploy ShortSTAK frac plugs in the heel of the well.

The ShortSTAK plugs were delivered downhole on PetroFrac's Smart Wireline Adapter Kit (WLAK) to reduce the risk of misruns. Advanced design features of the Smart WLAK include shorter overall length compared to conventional downhole assemblies, flexibility and a shock-absorption system. These innovations eliminate the risk of premature frac plug setting, particularly in highly deviated wells.

These short plugs made for faster and easier milling with less debris, and the flapper system of the plug eliminated the pumping requirements generally associated with ball-drop systems.



RESULTS:

This successful test of PetroFrac's ShortSTAK flapper with the Smart WLAK allowed the operator to confirm reduced water usage, reduced frac time, faster milling and no premature frac plug setting.



Water savings: ShortSTAK's unique flapper system eliminated the water needed to run each ball on seat in a conventional ball-drop completion (the total volume of this operator's tubing string was approximately 150 barrels or 6,500 gallons).



Time savings: The ShortSTAK flapper plugs allowed the time normally spent pumping balls on seat to be spent fracing wells (approximately 45 minutes to an hour per ball).



Milling time savings: ShortSTAK composite frac plugs are made of 5 to 8 times less material than conventional frac plugs, providing the operator 45% faster milling.



Smart WLAK efficiencies: no pre-sets, reduced operational risks.

With these advantages, the operator was able to capitalize on a successful run and will continue to work with PetroFrac on future operations.

FEATURE/BENEFITS OF SHORTSTAK

- 7 inches overall plug length is significantly shorter than a ball-drop plug
- Fully composite patent-pending design
- 5-8 times less material than conventional plugs
- Anti-rotation facilitates faster milling times and complete mill up
- Optimized for reduced debris size during mill out
- Barrel-slip design for 360° of casing engagement
- Backup ring prevents element extrusion
- Rated for 10,000 psi differential pressure and 300°F
- Proprietary WLAK design prevents pre-setting while running to setting depth
- WLAK is fully-compatible with conventional setting tools
- Optimized overall length allows for additional clusters in gun assembly
- Patent-pending flapper design reduces frac fluid usages compared to ball-drop systems