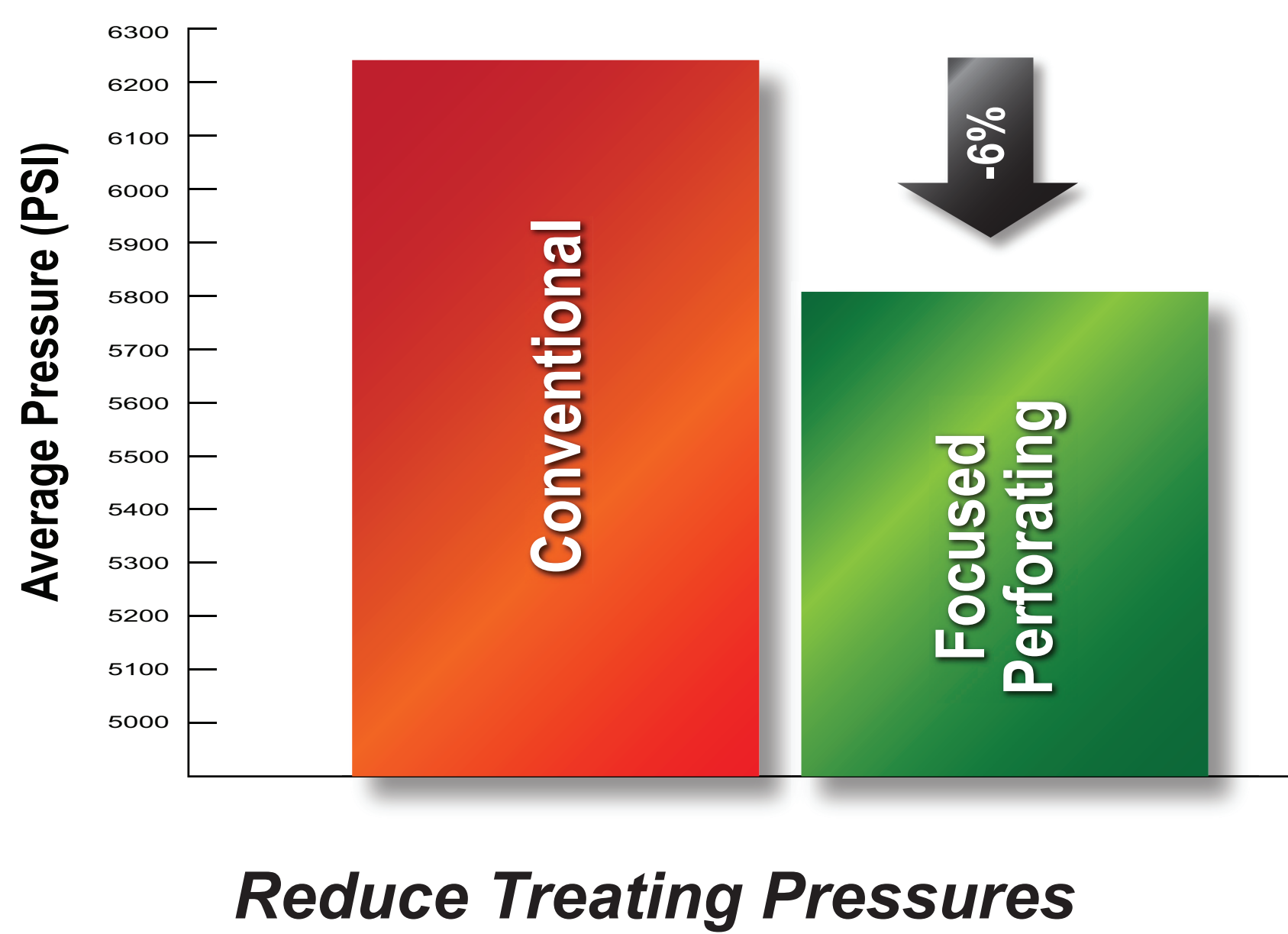
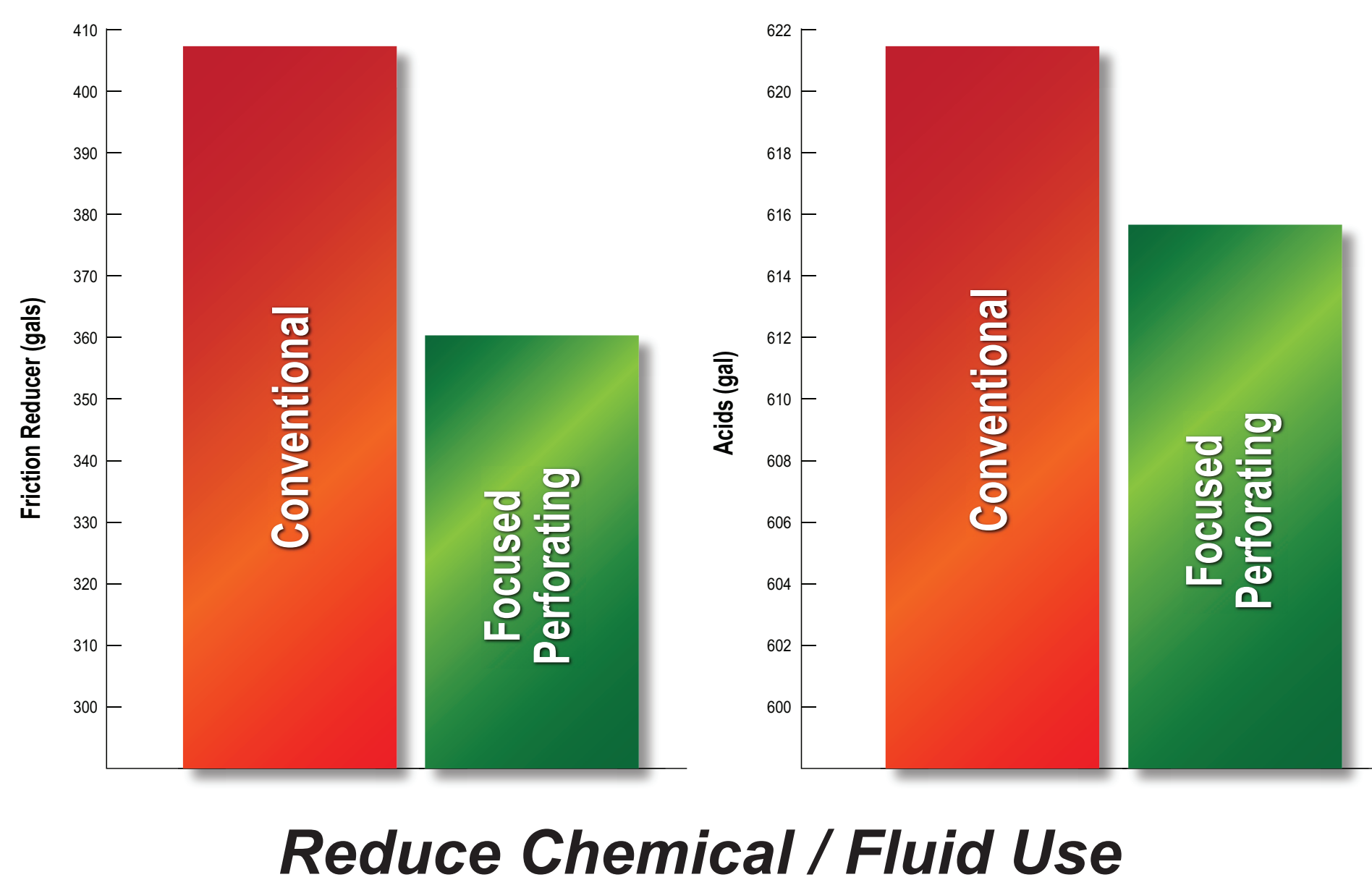
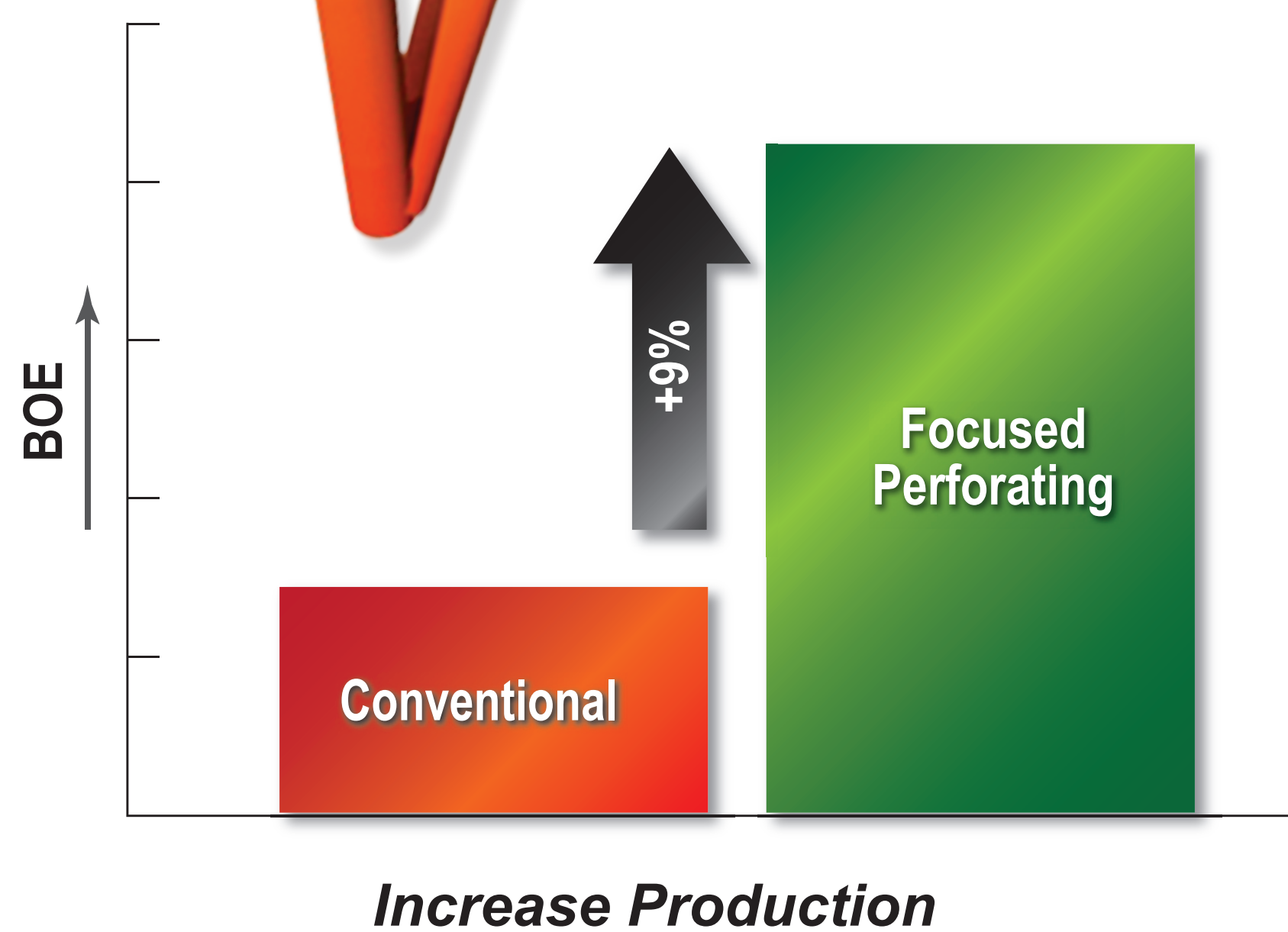


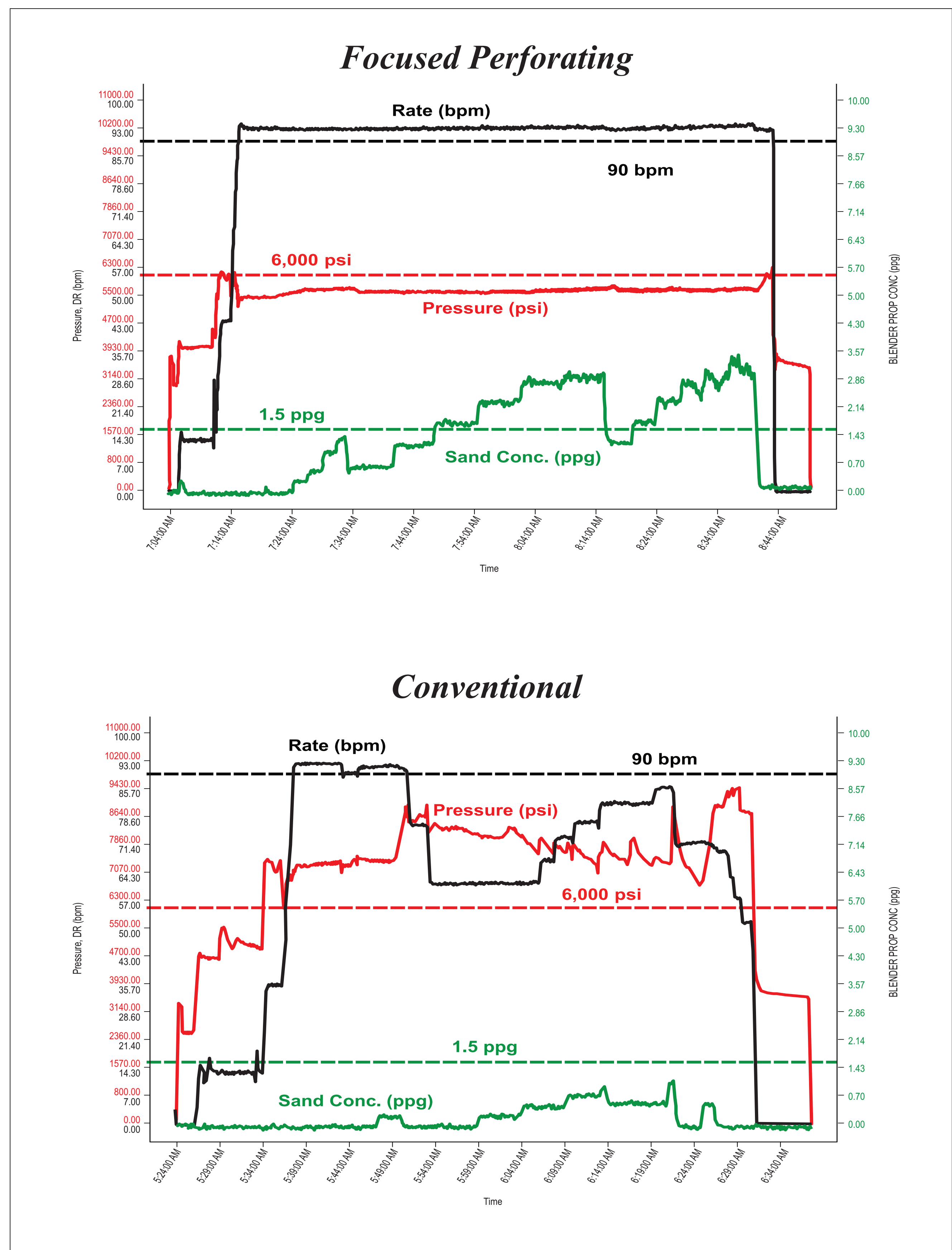
# Improved Frac Efficiency Using Focused Perforating

A new perforating technique developed for horizontal well completions utilizing angled shaped charge configurations to converge perforation tunnels and energy at the center of the perforating gun/cluster.

Converging the perforating tunnels on a single plane perpendicular to the casing axis at a fixed distance from the casing outside diameter is more effective for the initiation of transverse fractures at the center of the perforation clusters. This focused technique can reduce the propensity for perforations to create axial and multiple fractures allowing more effective stimulations and better production.



## Case Study



- Increase frac efficiency
- True limited entry configuration
- Significant more focused energy
- Reduce treatment pressures
- Reduce risks for screen-out