Case Study

Operator utilizes closeable FracPORT sleeves to significantly reduce water cut in the Sinai Peninsula

INTERNATIONAL, EGYPT
STACKFRAC HD SYSTEM, DC (DRILLABLE CLOSEABLE) FRACPORT

An operator working in Egypt's Sinai Peninsula required a multi-stage completion system where stages were flexible enough to allow for possible closure due to their proximity to potential water-bearing zones.

The operator ran an 8-stage StackFRAC® system with Drillable Closeable (DC) FracPORT™ sleeves inside a perforated cemented liner. The well was successfully stimulated and the bottom four sleeves were shifted closed to shut off water producing zones, resulting in significantly less water produced at surface. It was the operator's first time manipulating sleeves in a completion system.

Challenge

The Conglomerate formation in the Sinai Peninsula is a bottom water-drive reservoir with a strong supporting aquifier. Analysis of the surrounding rock indicated that vertical and horizontal permeability were nearly equal, increasing the likelihood of water enroachment leading to water breakthrough. Since previous wells had demonstrated extreme water coning, the necessity for effective water shut-off became pertinent.

Conventional fracturing techniques have had limited success due to lengthy delays and premature screenouts. Having previously used plug-and-perf completions, the operator was also looking for a solution to reduce operational time.

Solution

An operator installed an 8-stage StackFRAC system with DC FracPORT sleeves inside the pre-perforated and cemented 7-in. casing to a total depth of 10,800 ft. Each DC FracPORT sleeve was aligned with the perforations inside the casing. A Drillable Closeable Hydraulic (DCH) Shifting Tool run in on coiled tubing was used to shift the sleeves closed after stimulation. To function the shifting tool, fluid was pumped from the surface to expand the tool after reaching a depth below the desired stage. Continued pumping enabled the tool to latch into the DC FracPORT sleeve of the stage and close it. Shutting off fluid retracted the expansion keys of the shifting tool and allowed movement upward to the

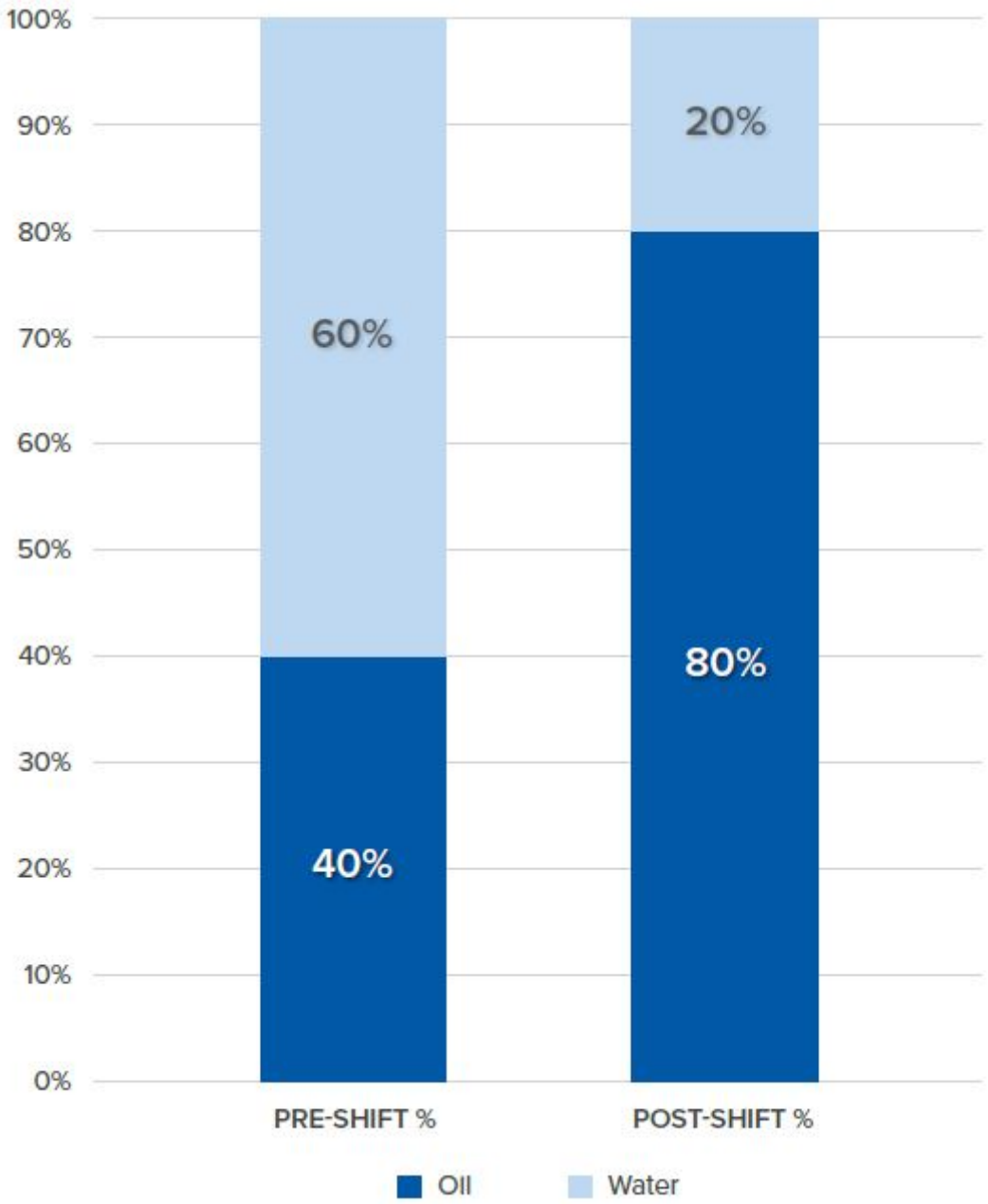
next stage.

Results

During production, the operator noted a higher than expected water cut percentage and attributed it to the four deeper stages. The bottom four sleeves for the stages were successfully shifted closed to prevent high water cut breakthrough to surface. Shifting operations were completed in a single run without any issues. After sleeve closure, the water cut was reduced from 377 bbls/d (60 m3/d) to 63 bbls/d (10 m3/d) or from 60% to 20% while keeping the same oil rate of 252 bbls/d (40 m3/d).

Compared to previous plug-and-perf operations, the operator also saved approximately 10 days in operational time with continuous pumping operations. After the success with the StackFRAC system, the operator installed an additional five systems in a six-month period.

Packers Plus is an innovator of multi-stage fracturing systems, providing field-proven and cost-effective methods for completing horizontal wells with superior production results in numerous formations around the world, including mature reservoirs.



Significant reduction in water cut observed after shifting bottom four sleeves closed.