Society of Petroleum Engineers
SPE Romanian Section

Case History Of A Successful Hydraulic Restimulation Pilot: The Story From Pilot Candidate Selection To Post-Job Evaluation and Rollout

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Abstract

This work presents the entire case history process from the recognition and identification of a potential candidate for multistage hydraulic re-stimulation. This includes operational preparations, execution, and how post-treatment results influenced the rollout of a pilot.

While the recognition of the potential candidate was a coincidence by intersecting a stimulated area from one well to a neighboring well, resulting in sustainable higher production, the study phase to identify the full field potential and candidate well identification was executed in a structured way. A primary challenge was the proper preparation of the well, while keeping the overall costs manageable.

Dedicated supply vessel has been used to accommodate stimulation equipment which was used to execute hydraulic stimulation treatments in the Black Sea. Hybrid designs have been designed to carry 20/40 RCP proppant, which was pumped in four cycles. Since reservoir has been accessed by originally opened sleeves with addition of new hydrajet cuts along horizontal section the need of special degradable diverter was required to ensure good lateral coverage and proppant distribution. Together with the treatment, hydrocarbon and water sensitive tracers were pumped, allowing an allocation of flow per cycle. After shutting in the well to allow the resin coated proppant to cure, the well was cleaned out with energized fluid and returned to production.

Within four hydraulic re-stimulation cycles, a total of 300 tons of proppant with approximately 2,000 m3 of fluid were pumped and successfully diverted. End of cycle ISIPs rose by more than 20 bars and back-calculation of volume of the diverter stages allowed identifying the diversion effect. During the initial flow phase, very high water cut was observed, exhibiting good cleanup of the treatment. After 2 weeks, the rate stabilized at double the pre-treatment rate and slightly above the conservative prediction.

Multistage hydraulic re-stimulation is not well utilized in Europe thus far and has not been applied offshore. In this mature field, the entire process from study to execution and post-job analysis was strongly cost driven, but resulted in the potential for six more hydraulically stimulated wells in this field.

Biography

Peter Janiczek holds a BSc, MSc, and Ph.D. from the University of Leoben in Petroleum Engineering. He currently is a Senior Expert Development with a strong background in production technology and focus on stimulation engineering, mainly working for major development projects and operations support with 15 years of oil & gas experience, particularly in upstream.

Peter published several papers in peer-reviewed chemical engineering journals and also within SPE about chemical tracers, fluid development, fracturing, and re-fracturing.

He was the technical authority for high-pressure stimulation within OMV for global and is actively training and mentoring young professionals and was recently awarded with the SPE Regional Completions Optimization and Technology Award and the OMV Excellence Award.