

Jet Lift: Bridge the Gap Between Various Forms of AL

Mauricio Monzon, production engineer, Apache Corp.

John Massey, jet lift engineer, Prime Pump Solutions (ChampionX Artificial Lift)

The objective of this paper is to share insights from a case history of jet lift applications in the Permian Yeso play. Apache Corporation was among the first operators to deploy horizontal drilling and multistage fracturing in the Yeso formation in Eddy County, N.M., targeting dolostone/limestone/sandstone reservoirs interbedded with shale and anhydrite. The Yeso yields oil and liquids-rich gas at depths averaging 5,000-6,000 feet.

Apache's initial strategy was to commence post-flowback production from fractured wells with electrical submersible pumps, and then transition to rod lift as rates declined over time. However, as the wells approached the transition window between ESPs and rod pumps, high sand content and gas-to-liquids ratios caused frequent downtime for both types of lift, negatively impacting well performance.

To counter these problems and accommodate the solids and GORs, the operator installed concentric string jet lift. This solution effectively bridged the application gap between high-rate ESPs in early well life and lower-rate rod pumps later in the lifecycle.

Referencing the well data, the results section summarizes how jet lift operations successfully handled variable flow rates with high GORs / solids while achieving targeted drawdown and production output. The results demonstrate that jet lift improved uptime, maintained expected production decline, and reduced cost by eliminating frequent workovers to repair rod pump components.

The novelty of this approach is the extended application range for jet lift, emphasizing its inherent flexibility in transitioning to different forms of artificial lift to meet changing production profiles as horizontal wells progress through their characteristic steep decline curves when faced with a deviated well that will increase rod-on-tubing failures and premature wear of the pump.

The discussion synthesizes jet lift's applicability across the lifecycle in horizontal resource plays, and the problem-solving benefits of concentric tubing string designs.

The paper concludes with an assessment of jet lift's evolving capabilities; specifically, how advancements in downhole sensors, remote monitoring / automation, and digital optimization are capturing value and enabling operators to deploy jet lift as an alternate lift system.