LIGHTNING PRODUCTION SERVICES

High Rate ESP Conversions

High Rate Conversions from ESP to Rod Pump Made Possible with the Hi-Rise System. ESP is an inefficient production method below 1000 bfpd, but sucker rod pumping has traditionally not been able to move more than 300 bfpd from below 8,000 ft. Operators are eager to find a cost-effective method to operate wells between 300-1000 bfpd, especially in deep, deviated wellbores.

With access to long stroke pumping units and continuous rod becoming more readily available, operators are beginning to push the limits on possible production rates with rod pump systems. This new application is filling the void between 300-1000 bfpd that previously required a costly ESP.

How Does Continuous Rod Work in Conjunction with Long Stroke Units?
The biggest challenge in deep, high producing wells is finding a design that doesn't overload the pumping unit gearbox. With long stroke units, the geometry places much less stress on the gearbox, allowing for very high production rates. The limit of the system with long stroke units is typically not the gearbox, but instead the structure rating of the unit or the loading limit of the rod string.

When a high production well is very deviated, the problems are magnified. Side loading and drag loading are extremely impactful in reducing overall production rate. Deviated wells typically require the use of rod guides which introduce extra friction into the system. Continuous rod operates without rod guides by distributing the side loading over the entire length of the rod string. This reduces the friction in the wellbore, allowing the operator to produce more fluid. Additionally, a continuous rod string is up to 10% lighter than the same string with conventional rod. This is due to the removal of weights caused by the upset, coupling, and rod guides.

Another advantage is that continuous rod can use a larger taper size than conventional rod due to the absence of the upset. For example, in 2-7/8" production tubing, the rod string is limited to a maximum diameter of 1" with slimhole couplings. With continuous rod, a 1-1/8" taper can be used without any issues, greatly improving the maximum loading of the rod string.

High Rate ESP Conversions

Improving Maximum Production with Continuous Rod

LPS has several installations with long stroke units making fluid rates that would not be possible using conventional pumping methods. The following example is a case with a pump set at 8,000 ft in a wellbore with high side loads near the top of the string.

The long stroke continuous rod case can produce 475 additional bfpd when compared to a conventional geometry unit with stick rod. This allows the operator to convert to rod pumping earlier in the life of the well, eliminating a costly ESP workover and avoiding the issues with low rate ESP inefficiency.

	CONVENTIONAL	FIBERGLASS	LONG STROKE STEEL	LONG STROKE CONTINUOUS
Production, BFPD	300	400	615	775
Pump Bore Size, in	2”	2”	2”	2.25”
Taper Size	86	86	87	97
Gearbox Load	102%	78%	77%	87%
Rod Load	89%	97%	100%	85%
PPRL, lbs	40,098	34,731	44,265	48,569
MPRL, lbs	11,317	9,441	13,189	13,262

Contact an LPS Sales Rep. today to overcome challenges in unconventional wellbores with the Hi-Rise System by LPS.

LEARN MORE AT LPSUS.COM/HI-RISE-SYSTEM