Hollow Sucker Rods: Development and applications in Beam Pumping

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Abstract

Historically the industry has used standard API 11B sucker rods to transmit power and axial movement from the prime mover at surface to the downhole pumps. The challenging well conditions in horizontal unconventional or conventional operations have pushed the limits of the Beam Pumping, reducing the mean time between failures (MTBF) and increasing the operational cost.

The complexity of this new scenario is mainly based on the presence of high dogleg severity, corrosive environments, paraffin, asphaltenes, scale, solids, erosion, etc. These well conditions directly affect one of the most important KPIs for production engineers or artificial lift specialist, keep the Lease Operating Expenses (LOE) to a minimum while ensuring a non-stop production flow.

Manufactured from proprietary steel quenched & tempered heat treated seamless pipe, the Hollow Sucker Rod (HSR) was developed in essence to address rod-tubing wear issues and chemical treatment flow assurance features among others. To achieve these goals the HSR counts with:

- External flush connection to minimize rod/tubing wear
- Accessories to inject different kind of fluids through the inside and target interest zones
- Internal near flush connection to reduce fluid turbulence
- Increased fatigue resistance to support both rotating and alternating loads
- Angled torque shoulder provides high torque capacity for rotating applications and a tougher connection for compression conditions.

This presentation aims to show the R&D process behind the Hollow Sucker Rod and the experience with different applications tested in Beam Pumping.