

Title: Sucker Rod Connections Reliability improvement via diagnostics of power tongs

For many decades hydraulic systems have been used in a wide range of applications, generally where power rather than precision is required.

In Rig equipment in the Oil & Gas industry, the aforementioned power sources are used, which consist of a hydraulic engine generally driven by a combustion engine and an oil reservoir tank that keeps the system fed with hydraulic fluid.

In general, lifting equipment and torque equipment for connections assembly (rod, tubing, casing tongs), among others, need hydraulic systems to provide energy for their operation.

Just as the system provides the energy for its components to function, there are conditions that generate deviation from ideal operation. Therefore, it is important to consider that the power tong and the hydraulic circuit must function together in harmony ensure proper connection make-up. Any deviation or deficiency in any of these components will negatively impact the rod make-up.

In the specific case of Rod power tong, load losses in the hydraulic circuit and the wear of transmission mechanisms generate deviations that affect the torque delivered and consequently the circumferential displacement (CD). The latter is measured in fraction of inches or millimeters, being very sensitive to dispersion since it is a condition for correct assembly, or in other words, CD dispersion is a major cause of improper connection make-up and the subsequent failures in sucker rods.

This presentation describes a Tenaris' developed power tong torque measuring instrumentation and the analysis of data collected on hydraulic powered sucker rod tongs. A total of 60 systems well intervention rigs were measured in a wide range of ambient conditions.

With the results, we seek to establish behavioral parameters that can be presented for analysis. The ultimate goal is to have a diagnostics tool that help the well servicing companies and operators identify and fix the deficiencies in the power tongs and help improve sucker rod connection reliability.

Finally, a preview of the new developments that will expand the level of measurement of variables and monitoring in real time will be presented.