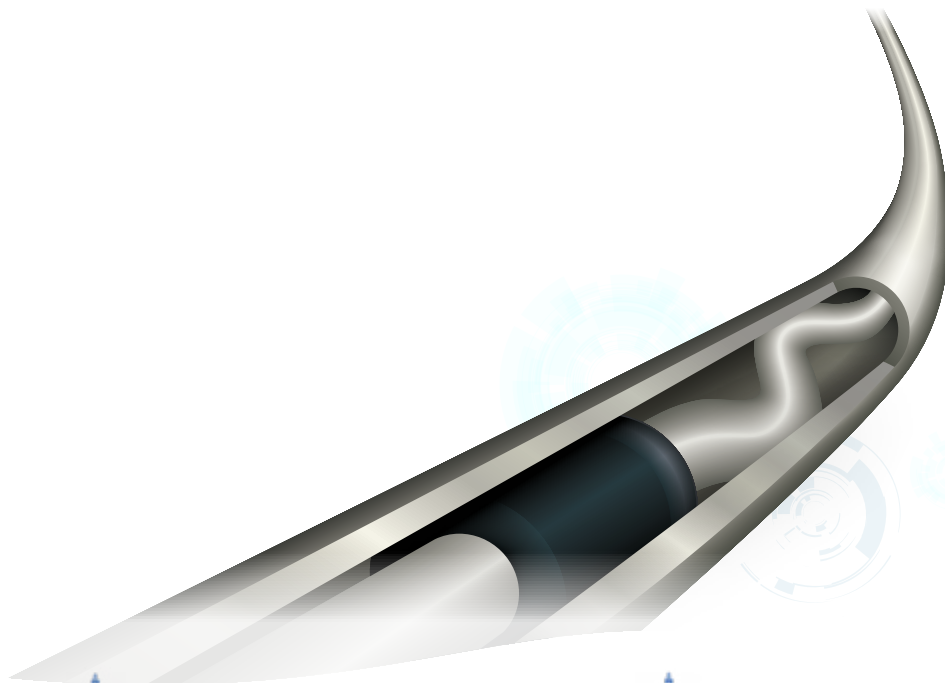


TMPRO® Tubing Movement Model

Overview

Many well completions and workovers occur through one or more tubing and packer systems. Changes in temperature and pressure inside or outside the tubing will either result in a tubing length change or induce force in the tubing and on the packer. In deep wells, conditions are even more critical, requiring proper engineering analysis to prevent tubing and packer failures.

Pegasus Vertex, Inc. has developed TMPRO, a software that performs calculations on length change to force distribution. It checks the tubing and packer integrity during various operations. Based on Lubinski and Hammerlindl theories, TMPRO is an easy-to-use tool to identify and avoid potential tubing/packer issues.



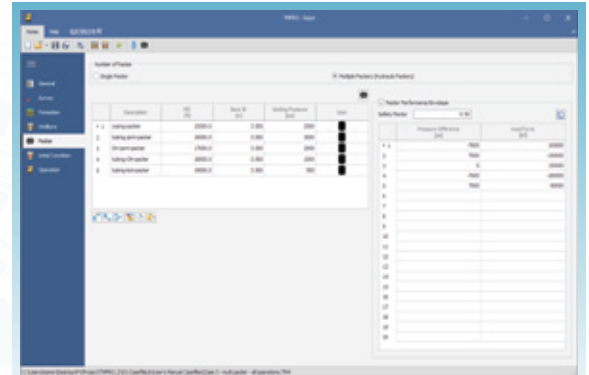


Features

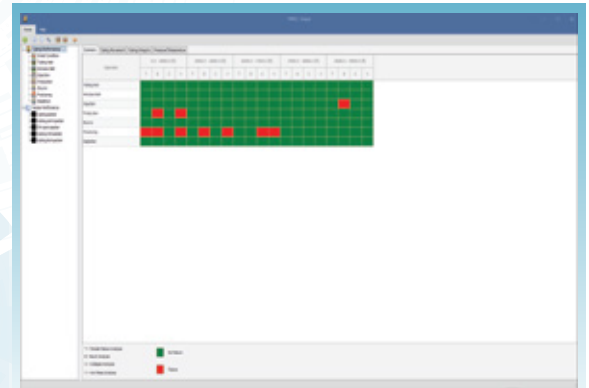
- Tubing movement evaluation for 7 types of operations
- Up to 20 operations can be simulated in one run
- Single or multiple packer analysis (up to 15 packers)
- Vertical or directional wells
- Packer movement: free motion, limited motion, or anchored
- Packer setting mechanisms: mechanically, hydraulically, or hydrostatically
- Operation design to optimize packer setting
- Both tubing and packer failure analysis
- Packer performance envelope
- Editable tubular and packer database
- Tubing movement: piston, buckling, ballooning, temperature, and packer setting effects
- Tubing integrity: tension, collapse, burst, tri-axial, and buckling
- Packer-to-tubing and packer-to-casing forces
- Fluid flow and frictional pressure loss in both tubing and annulus
- Expansion joint, electrical submersible pump (ESP), and jet pump
- Forward or reverse circulation
- Slack-off or pick-up weight on hydraulically setting packers
- Design factors of tubing and packer
- Microsoft Word® report
- Oil field, SI, and customized units

System Requirements

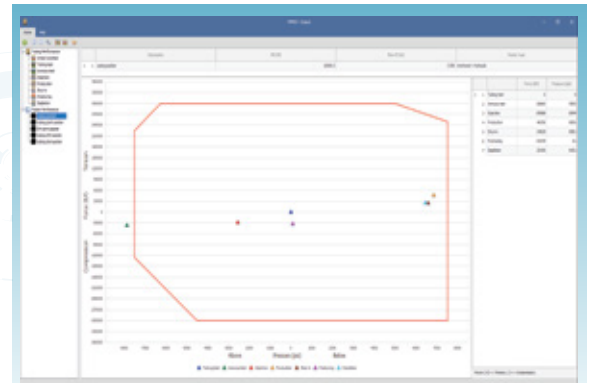
- Microsoft Windows® 10 or above
- Microsoft Office® 2016 or above
- Dual-core processor, 1.4 GHz or higher (Not compatible with ARM processor)
- 4 GB RAM
- 200 MB of free disk space for installation
- 1,280 x 768 display resolution



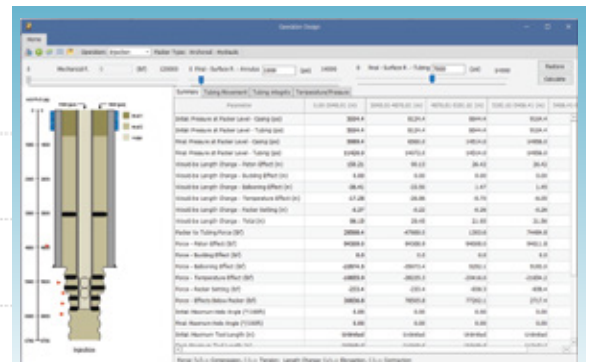
5 Packers with Packer Performance Envelopes



Tubing Performance in Multiple Operations



Packer Performance in Multiple Operations



Operation Design