What's New in PIPESIM 2015

New-generation steady-state multiphase flow simulator helps overcome fluid flow challenges

KEY FEATURES

- Gas lift design accounts for changing conditions and hydraulic effects of the total system
- Gas lift diagnostics analyzes performance of gas lift valve systems
- OneSubsea multiphase booster provides rigorous performance analysis
- Perforation design determines optimal perforating gun selection, phasing, and spacing
- Data matching automatically tunes multiphase flow and heat transfer coefficients
- Advanced network solver helps solve complex network problems

The PIPESIM* steady-state multiphase flow simulator has provided accurate flow modeling for well and network design and operations for more than 30 years. PIPESIM 2015 expands overall functionality with a focus on advanced well modeling and artificial lift.

Gas lift design

PIPESIM 2015 has several enhancements for gas lift design. Bracketing calculations can be used to ensure that the design accounts for changing conditions. Users can also incorporate into the design the hydraulic effects of flowlines, risers, and equipment downstream of the wellhead.
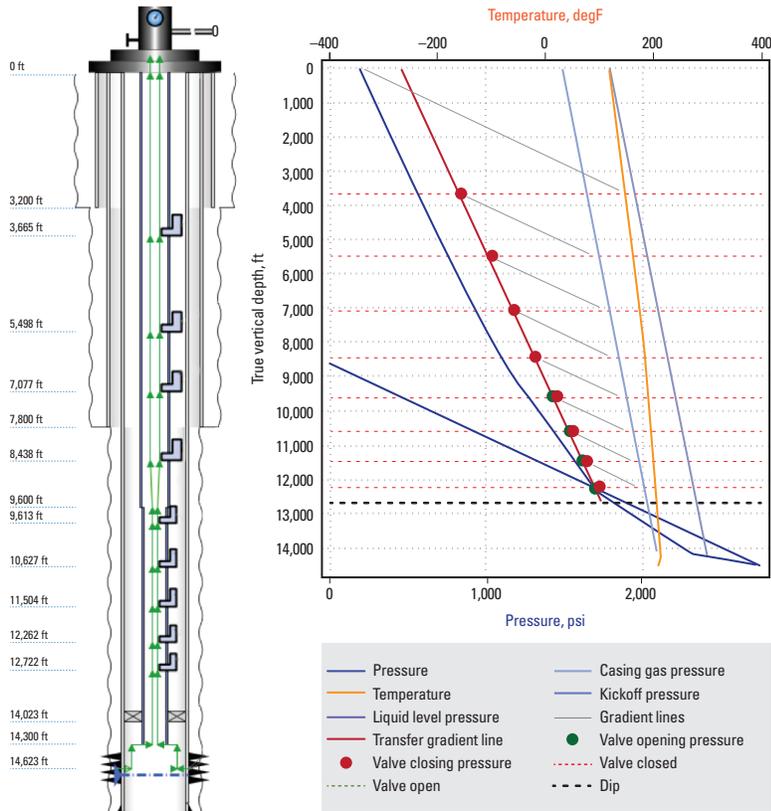
The PIPESIM 2015 gas lift interface improves design selection.

Gas lift diagnostics

Gas lift diagnostics can be used to analyze the performance of wells equipped with gas lift valve systems.

PIPESIM 2015 enables users to specify both the total gas lift injection rate and the injection pressure to calculate a tuning factor to ensure valve performance equations match observed data. This tuning factor can be applied to the valve system for more accurate modeling. Additional improvements include frictional effects for gas injection in the annulus and the introduction of the rigorous DAK–Sutton nitrogen temperature correction factors for more accurate modeling at higher pressures.

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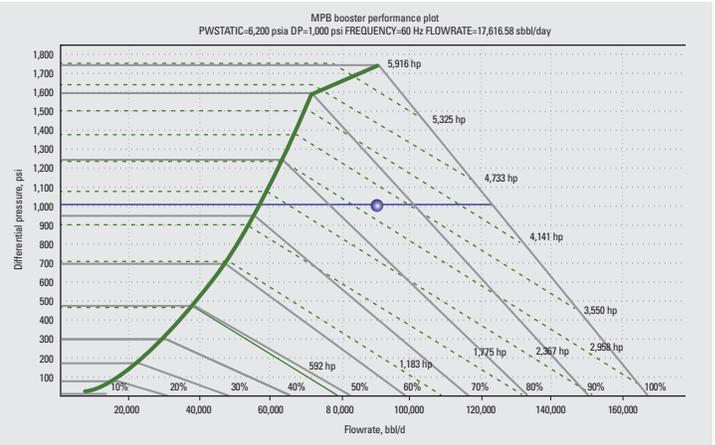
PIPESIM 2015 uses operating conditions to generate performance maps for OneSubsea multiphase boosters.

OneSubsea multiphase booster performance analysis

The OneSubsea helicoaxial multiphase booster allows rigorous performance analysis for a variety of booster models to enhance design and operation. Booster performance maps are generated for all simulation cases based on actual operating conditions, enabling users to quickly evaluate performance and identify constraints.

Perforation design

Rigorous perforation design for determining the optimal perforating gun selection, phasing, and spacing is now available. In addition to the standard concrete method based on API RP 19B test data, an advanced rock model developed by Schlumberger is available. The resulting design can be used to update the well model with entrance hole diameter and penetration depth data, which are needed to calculate the skin factor of the vertical or horizontal completion.

Data-matching improvements

Observed pressure and temperature data can now be automatically matched to a model by tuning the multiphase flow model and heat transfer coefficients. The PIPESIM simulator simultaneously optimizes correction factors to minimize errors in pressure drop, liquid holdup, and temperature changes for a wide range of multiphase flow models. Results can be quickly visualized and inspected before applying the correction factors to the model, which can then be used to construct more accurate optimization scenarios or future performance predictions.

Survey data can be directly imported into the PIPESIM simulator through LAS files for production log analysis. This workflow supports quick, effective analysis of production log data and model calibration for determining zonal performance so that workover scenarios can be analyzed and quantified.

Advanced network solver

PIPESIM 2015 introduces the advanced network solver, which is based on Newton's method for simultaneous solution of all flow equations. Although the default network solver is robust, the advanced network solver is intended for solving particularly complex or advanced optimization cases.

Additional new features and improvements

- Improvements to pigging calculations, including transit and dumping times
- Atmospheric pressure reference
- Nodal analysis usability enhancements, including operating envelope
- Heat transfer alignment with OLGA* dynamic multiphase flow simulator
- Improvements to network license performance
- Improvements to message passing interface (MPI) distribution for parallel processing
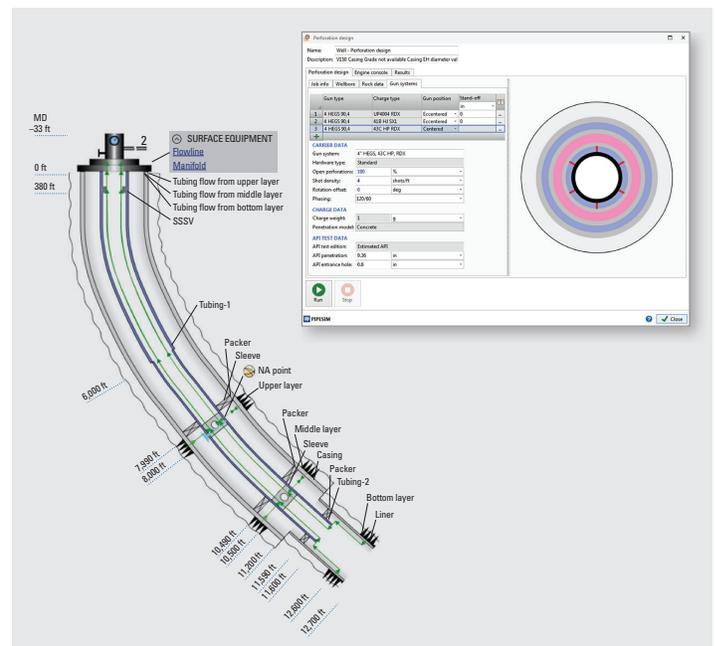
The perforation design feature of PIPESIM 2015 can be used to optimize reservoir productivity.

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Schlumberger