

Avocet Gas Lift Optimization Module

Improved optimization for gas-lifted wells

BENEFITS AND FEATURES

- Delivers an efficient optimization scheme to reduce run time
- Incorporates modularity for use within PIPESIM* network engine and Avocet* Integrated Asset Modeler software
- Optimizes PIPESIM gas-lift production networks without requiring changes to the model
- Supports well, global, and in-network constraints
- Enables the optimization of dual-string gas-lift wells
- Supports compositional network models
- Offers a solution for small, large, or complex networks (over 100 wells)
- Provides real-time, fast-loop optimization capabilities using Avocet Gas Lift Manager software
- Delivers results in tabular and graphical formats for reports or presentations

Every well has an optimal gas-lift operating point at which it will produce the most fluid. Optimization of the complete system necessitates an optimal allocation of the available (and usually limited) lift gas among all the gas-lifted wells. Due to the complexity of well, network, and processing-plant interactions and operating constraints, optimizing gas lift is far from a simple task.

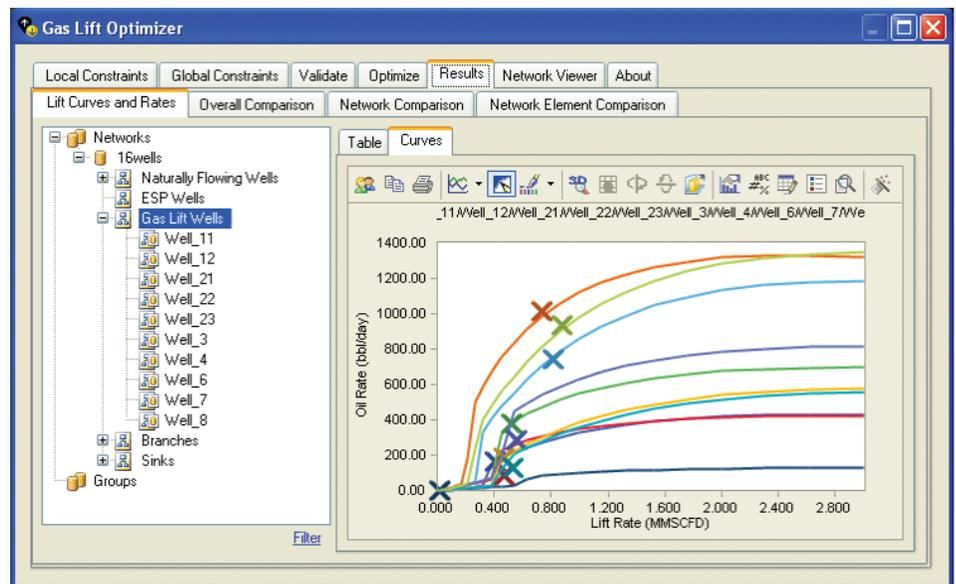
The Avocet Gas Lift Optimization module utilizes the PIPESIM network engine to model the production network at varying gas-lift injection rates. This modular technology has the following uses:

- Single production network and well simulation modeling using PIPESIM production system analysis software
- Optimization solving for Avocet Gas Lift Manager software—an integrated, online (real-time capable) gas-lift optimization and management system
- Multiple production and injection networks for asset optimization with PIPESIM software using Avocet Integrated Asset Modeler software—process facility constraints can also be integrated into the optimization process.

New optimization technology

Schlumberger-Doll Research was engaged to study streamlining the complexity and speed of the optimization process. The approach was to focus on reducing the number of mathematical steps, and the following new optimization algorithms were developed:

- Newton Reduction Method: a deterministic solver that works fast for networks without constraints
- Genetic Algorithm: a probabilistic solver that works for constrained networks.



The Avocet Gas Lift Optimization module delivers an integrated gas-lift optimization and management system.



Avocet Gas Lift Optimization Module

The new algorithms deliver streamlined optimization schemes and reduced run time, freeing valuable engineering time. Optimization can be performed on all sizes of asset—large (over 100 wells) or small—in a single run, for combined well and network models.

The built-in PIPESIM engine capability is leveraged to speed optimization and greatly reduce the number of hours it takes to configure and run an optimization scheme. The choice of optimization algorithm depends on the constraints applied to the network model and can be selected automatically.

Flexible workflows and results analysis

Constraints can be set up at several levels to create boundary conditions that will control how the optimization is performed.

Different types of optimization can be performed—total liquid produced, total gas produced, or total oil produced—depending on what drives the economics of the field.

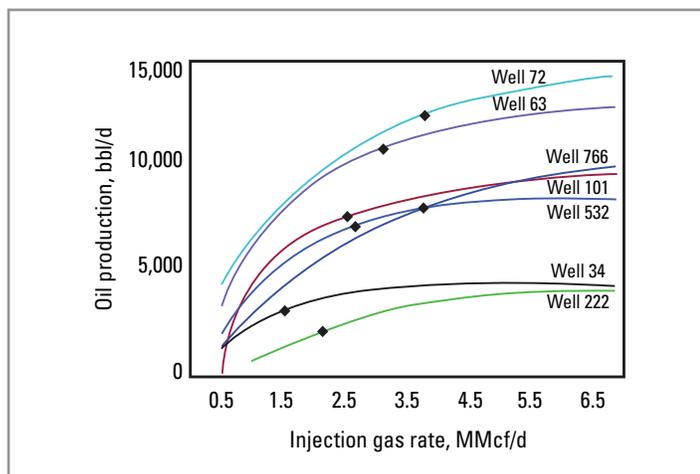
Optimization results are available in tabular and graphical formats, allowing you to

- identify underperforming wells
- deliver production enhancement opportunities; field studies have shown this to be as much as 20% per well where an opportunity is identified.

Pre- and postoptimization results can be compared in different ways, enabling the validation and quantification of production gains.

Increased production and reduced costs

- Field production can be increased by up to 10
- Lift gas requirements can be reduced by up to 40%



Gas-lifted wells are linked in a hydraulic model to determine the optimum injection gas rate to maximize production.

Online optimization

Using online data (real-time from SCADA, for example) and having the capability to readily repeat optimization workflows provides an “always-optimal” solution. Actions in the field can be taken knowing that the optimization results are based on the very latest operating conditions.

Avocet Gas Lift Manager software is a comprehensive gas-lift surveillance and management solution that uses real-time data. It allows for fast-loop identification of gas-lift completion problems and optimization opportunities. It has a single interface that supports multiple users, for managed, repeatable workflows. The system sets up and executes manual or automated optimization workflows, including scheduled and triggered optimization. It also ensures that the data required for surveillance-based optimization is reliably and comprehensively captured, cleansed, integrated, and stored.

Full asset optimization

Integrated asset modeling incorporates asset-level constraints and helps asset teams collaborate by providing a common frame of reference across technical and management disciplines.

To optimize gas-lift operations across an entire asset, the Avocet Gas Lift Optimization module is also designed to be used as a component of Avocet Integrated Asset Modeler software. Using this approach, models can be integrated from all production disciplines—reservoir, production, process facilities, and economics—to optimize gas-lift operations for an entire asset within a single production-management environment.

E-mail sisinfo@slb.com or contact your local Schlumberger representative to learn more.



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