Global Production Engineering Consulting

Complete flow assurance solutions

Proven solutions, recognized advisors

The Schlumberger production engineering consulting offering combines best-in-class simulation technology, production testing services, and customized advisory services to provide complete flow assurance solutions for any oil and gas development or operational challenge.

The PIPESIM* steady state multiphase flow simulator and the OLGA* dynamic multiphase flow simulator are the foundation of Schlumberger flow assurance solutions. Schlumberger is dedicated to the continuous improvement of these technologies and actively participates in ongoing industry research into multiphase flow.

With over 30 years of industry experience and unparalleled project expertise, our flow consulting experts can advise on the most complex flow assurance challenges and offer proven solutions to industry. Schlumberger advisors have been instrumental in developing the contemporary flow assurance discipline, which has enabled the development of some of the most complex oil and gas assets around the world.

Expert flow assurance advice for flowlines and wells

Our consulting services create value by addressing steady state through dynamic challenges in the front-end engineering and design (FEED), detailed design, and operation phases of projects. The offerings cover the topside processes, pipelines, wells, and near wellbore reservoir dynamics, as well as safety concerns associated with these system units.

Schlumberger flow assurance engineers lead projects and teams through all key design and operational aspects. Flow experts quantify threats and establish appropriate mitigation schemes, leading to viable design solutions and operational procedures. Our experts also provide specialist input to project teams, peer group reviews, and hazard operability studies and hazard identification.

We specialize in designing and optimizing well operations, such as wellbore cleanup, startup, gas well liquid loading and deliquification, well testing, and slugging. We provide trusted solutions for dynamic interaction between reservoir, well, and flowlines.

### Solutions for a variety of challenges

Schlumberger flow consulting services provides solutions for a wide variety of challenges, including the following:

- Pipeline and facility sizing
- Liquid management of slugs (slugging)
- Solids management of hydrate, wax, and asphaltene precipitation through insulation, heating, and hot fluid circulation mitigation strategies
- Operational procedures for startup or shutdown
- Wellbore startup, cleanup, and blowdown
- Artificial lift design and operation
- Full-field reservoir, well, and network deliverability modeling
- Well and pipeline integrity (e.g., corrosion)
- Well trajectory design verification
- Completion design
- Liquid loading in wells

Extensive global network for efficient delivery

Efficient project delivery is a key strength of our consulting service. Access to technology and resources allows services to be scaled to meet your specific needs. With a global and flexible consulting base, we leverage our resources when needed to match your project requirements.

Delivering projects out of all major oil and gas hubs, the dedicated Schlumberger flow assurance consulting group provides access to a large pool of flow assurance experts.
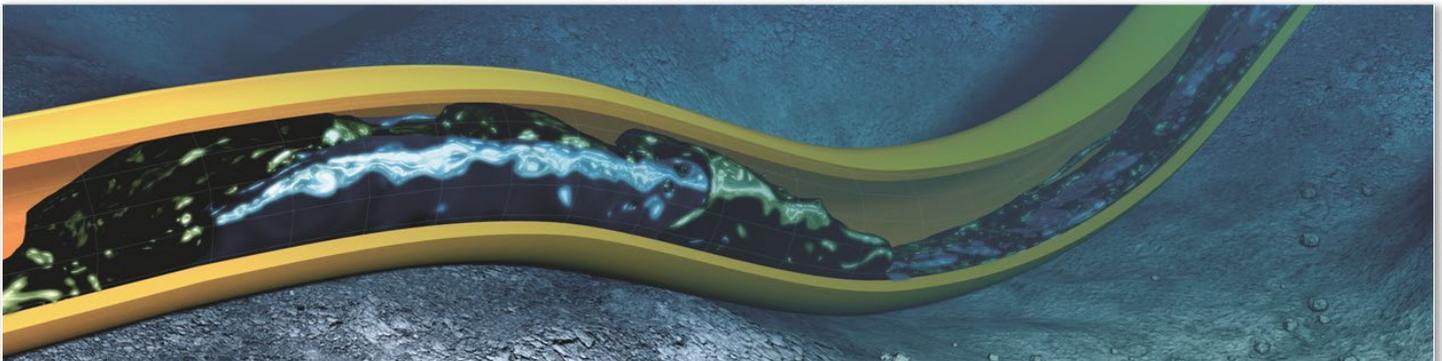
Enabling the full potential of operational investments and providing unmatched technical competence in production engineering.

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Recent Projects—Technical References

Pipeline Flow Assurance

- A Structured Approach for the Evaluation of Uncertainties in Flow Assurance System, BHR 2013-B2, 2013
- Sizing of Gas-Condensate Pipelines Using Multiphase Dynamic Simulation, Based on Minimum, Medium, and Maximum Flow Rates, SPE 15326-MS, 2012

Well Flow Assurance (Hydrate, wax, liquid loading)

- Gas Condensate Well Unloading Critical Rate, SPE 166350-MS, 2013
- The Use of a Transient Multiphase Simulator to Predict and Suppress Flow Instabilities in a Horizontal Shale Oil Well, SPE 158500-MS, 2012
- Experimental Study on Wax Deposition Characteristics of a Waxy Crude Oil Under Single Phase, OTC 22953, 2012
- A Flow Assurance Study on Elemental Sulfur Deposition in Sour Gas Wells, SPE 147244, 2011
- Impact of Water Hammer in Deep Sea Water Injection, SPE 146300, 2011

Well Testing

- Use of Dynamic Simulation to Refine Well Testing Procedures and Optimise the Data Required for Deconvolution Techniques, OTC 19767-MS, 2009
- Well Test by Design, Transient Modelling to Predict Behaviour in Extreme Wells, SPE 101872, 2006

Well Integrity (Leakage, erosion, corrosion, well control)

- Using a Multiphase Transient Simulator to Predict the Onset of Corrosion in Wellbore, SPE 170403, 2014

Well Cleanup and Start-up

- Simulation of Multiphase Fluid-Hammer Effects During Well StartUp and Shut-In, SPE 160049, 2013
- Using Dynamic Simulations to Predict and Optimize Cleanup Operation of Horizontal Gas Wells, SPE 152975-MS, 2012
- Modeling the Clean-Up Operation of a Producer Well in the Gulf of Mexico, 2010-J3 BHR, 2010

Well Control

- Realistic Well Planning with Dynamic Well Control, 2011-092 OMC, 2011

Artificial Lift

- Using Dynamic Simulation to Assess Effectiveness of Downhole Pump for Gas Well Deliquification, SPE 166093-MS, 2013
- Downhole Chemical Injection Through Gas Lift: Options and Consequences, SPE 142951, 2011

Reservoir-Wellbore Interactions

- Multiple-Objective Optimization Applied to Well Path Design under Geological Uncertainty, SPE 141712-MS, 2011
- Application of Integrated Production and Reservoir Modeling to Optimize Deepwater Development, SPE 131621-MS, 2010
- Use of Wellbore-Reservoir Coupled Dynamic Simulation to Evaluate the Cycling Capability of Liquid-Loaded Gas Wells, SPE 134948-MS

Our experts provide support in solving flow assurance design and operational challenges across the entire production system.

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