

# Staatsolie Optimizes Pipeline Network Management with PIPESIM Software

Accurate simulations drive better decisions and improve efficiency

## CHALLENGE

- Improve pipeline management for Tambaredjo North West field
- Standardize data retrieval methods
- Remove bottlenecks to improve artificial-lift performance
- Improve production decision making and collaboration

## SOLUTION

- Create network model using PIPESIM\* software, including field pressure matching, forecasted volumes for future wells, visible pressure distribution, and maximum suction pressure specification
- Determine booster pump requirements and optimize pressures
- Pinpoint and explain volume differences from well settings

## RESULTS

The network-modeling capabilities of PIPESIM software helped Staatsolie

- improve decision making
- reduce equipment costs
- remove bottlenecks
- manage water cuts and emulsions
- improve well test validation
- drive collaboration between field and office engineers.

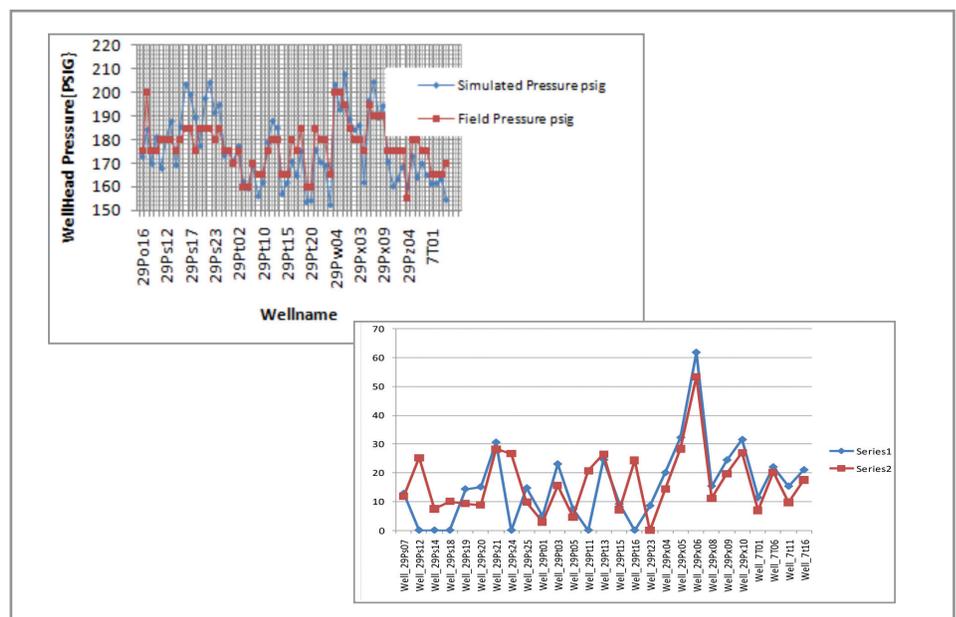
Staatsolie—the state oil company of Suriname—needed to improve its production management for the Tambaredjo North West heavy oil field. A swamp environment necessitates using amphibious rigs and service units to drill and complete wells. Airboats are used to access over 100 wells and related facilities. Because there was no SCADA system in the downhole gauges, data retrieval was manual and time consuming. The 150-branch, 250-node network suffered from bottlenecks, and back pressure was affecting progressive cavity pumping (PCP) lift performance.

Staatsolie met with Schlumberger to discuss network management improvements. A solution using PIPESIM production system analysis software was outlined, including a redesigned header for flow transport, improved parameter selection based on flowing emulsion viscosities to reduce backpressures, and a multiphase booster pump design based on simulation results. Staatsolie engineers would use PIPESIM software to simulate future field pressure distributions, as well as flow efficiencies.

## Modeling for insight and efficiency

Firstly, the team created a network model using PIPESIM software based on 45 wells, and then gradually extended it to cover the 100-plus wells in the field. Fluid properties were based on the limited pressure-volume-temperature (PVT) reports available. Horizontal and vertical flow correlation sensitivity simulations were run. Friction factors and liquid holdup measurements were specified for the matching process with field production data.

The new pipeline model included field pressure matching, forecasted volumes for future wells, visible pressure distribution, and maximum suction pressure calculation. It also allowed engineers to optimize the placement of pressure-relieving pumps, to alleviate bottlenecks. Network model results were matched against total flow from the field, and the differential was found to be within 5% of actuals each time.



Pressure and rate matching.

## CASE STUDY: Accurate simulations drive better decisions and improve efficiency in Suriname field

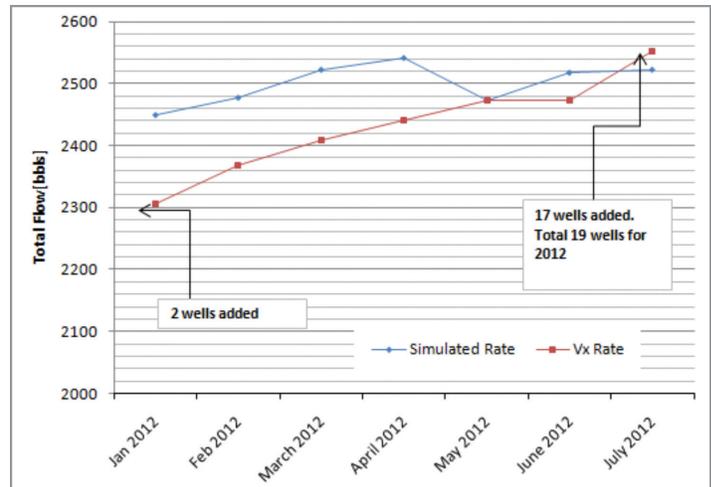
Staatsolie had planned to transfer produced oil to the treatment plant using multiphase booster pumps. Once the wells were drilled and completed, the team soon suspected that the wells could flow unaided to the treatment plant, due to the emulsion viscosity, making the pumps redundant. This possibility had not been modeled when the multiphase pumps were designed, however PIPESIM software allowed engineers to simulate flow results and confirm their suspicions. The network model optimized pump design and reduced costs by avoiding the purchase of additional or unnecessarily oversized pumps.

### Valued benefits

The powerful network-modeling capabilities of PIPESIM software helped Staatsolie model and predict production system and flow behavior to improve decision making for field development planning, reduce equipment costs, and optimize pressures to remove bottlenecks. The company also achieved a better understanding of the impact of water and the occurrence of emulsions, improved well test validation, and enhanced collaboration between field and office engineers.

The new system also allowed Staatsolie engineers to explain a significant production volume difference from the operational well settings that arose, as well as access well measurements instantly—rather than having to do so manually. PIPESIM software also delivered time savings of up to 10% on all engineering activity.

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Network model results matched against flow meter actuals.

**“PIPESIM software has significantly improved our production operations and enabled us to make better decisions. Intelligence from the network model has saved substantial future equipment costs and exposed hidden bottlenecks. We also benefit from better flow-rate estimation as a result of regular simulation runs—combining well and pump performance.”**

**Amresh Mohan**  
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[www.slb.com/pipesim](http://www.slb.com/pipesim)

**Schlumberger**