# FLOWNEX® SIMULATION ENVIRONMENT OIL

**Flownex® SE determines pressure drop [flow] and heat transfer [temperature] for the connected components of a complete system in steady state and transient, e.g. pumps or compressors, pipes, valves, tanks and heat exchangers.**

## TYPICAL USES:

### ANALYSIS

- Simulation.
- Performance assessment.
- Modification assessment.
- Fault root cause assessment.

### DESIGN

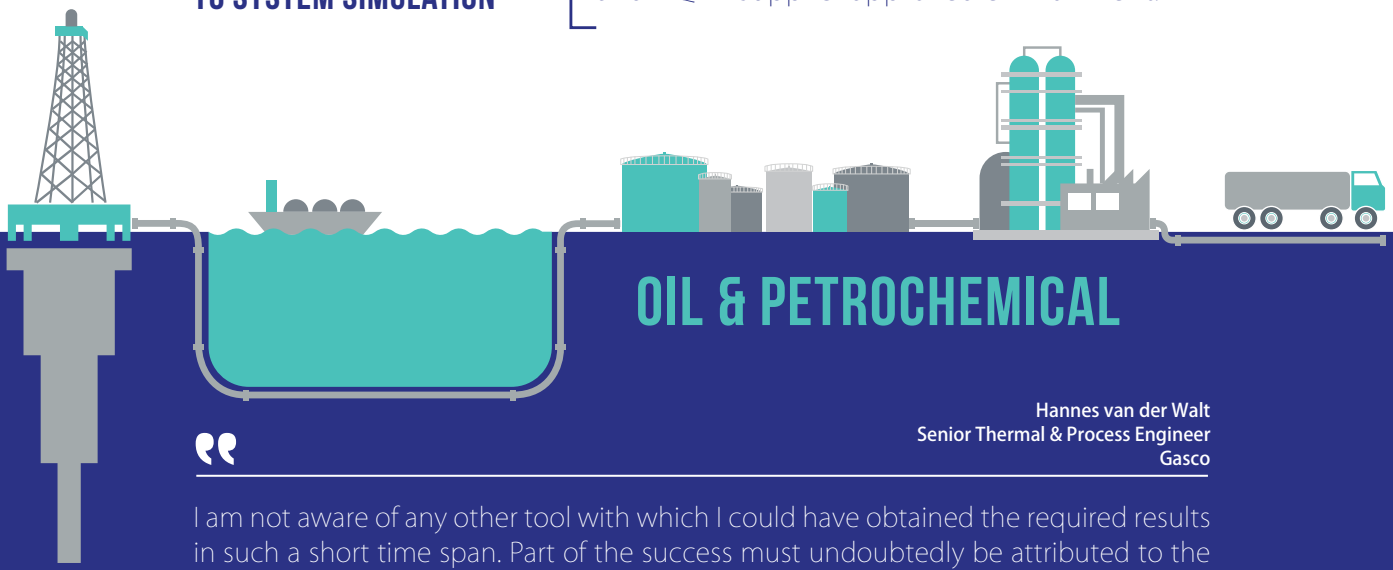
- System sizing.
- Component sizing.
- Determining operating ranges.
- Flow, temperature, pressure, power consumption, etc.
- Testing of control philosophy.

### TRAINING

- System behavior examination.
- Performing basic flow and heat transfer calculations.
- Thermohydraulic principles and properties referencing.

## BRINGING NUCLEAR QUALITY AND STANDARDS TO SYSTEM SIMULATION

Flownex® is developed in an ISO 9001:2008 quality assurance system and NQA1 supplier approved environment.



## OIL & PETROCHEMICAL

**Hannes van der Walt**
**Senior Thermal & Process Engineer**
**Gasco**

"I am not aware of any other tool with which I could have obtained the required results in such a short time span. Part of the success must undoubtedly be attributed to the prompt and high level support provided by Flownex® International almost daily in answering all my questions and offering suggestions throughout this very technically challenging simulation. The support fee has been paid for with this one project!"

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Find us on:

# STEAM SYSTEMS

### FEED WATER

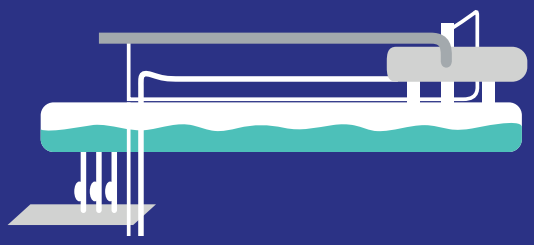
- Root cause analysis of pump NPSH problems.
- Analysis of feed water heater tube breaks.
- Cavitation/phase change detection.

### COOLING WATER CIRCUITS

- Flow balancing.
- Pump and pipe sizing.
- Energy optimization.
- Heat load calculations.
- Heat exchanger sizing.
- Water reticulation system design.
- Water hammer analysis and prevention.
- Environment - cooling tower - plant matching.

### NATURAL CIRCULATION BOILERS

- Calculation of recirculation rate and steam production.
- Prediction of dry out.



### SUPER HEATER AND MAIN STEAM PIPING

- Calculation of metal temperatures and change rates.
- Commissioning assistance.
- Pipe sizing.

### STEAM TURBINE & SUPPORTING SYSTEMS

- Start-up and shutdown simulation.
- Turbine trip control simulation.
- Gland steam system analysis.
- Lubrication system analysis.

### ONCE-THROUGH BOILERS

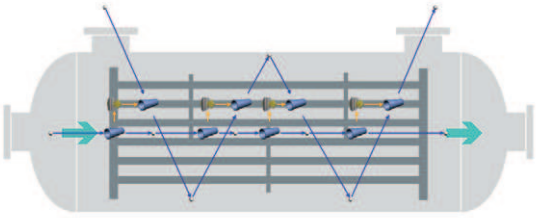
- Flow balancing.
- Assessment of boiling stability.
- Calculation of flow/boiling regimes.
- Assessment of control.

# DRILLING MUD PUMPING SYSTEMS FOR OIL WELLS

- Calculation of Non-Newtonian fluid pressure drop.
- Balancing of flow in branching pipe networks.
- Assessment of pressure pulse transients.

# HEAT EXCHANGERS

- Calculating heat transfer and pressure drop for various geometries: finned tube, shell and tube, tube-in-tube, plate heat exchangers.
- Calculating the heating or cooling requirement for various processes: evaporation, condensation or temperature control.
- Calculation of natural circulation evaporators' recirculation rate.
- Simulation of transient behavior for startup, shut-down or process upset conditions.
- Calculation of temperatures and boiling pressure drop.
- Calculation of metal temperature change rates during transients.



# FIRE PROTECTION SYSTEMS

- Pump, pipe and tank sizing.
- Sizing of nozzles and orifices.
- Flow balancing.

# LIQUID HANDLING SYSTEMS

- Calculation of pressure drop for gases or liquids.
- Pump and pipeline sizing.
- Pump performance adjustment for viscosity.
- Sizing of control valves and orifices.
- Design of liquid distribution systems.
- Flow balancing in branching networks.
- Analysis of transient events like pressure wave (water hammer/ surge) propagation.
- Control philosophy development and testing using the built-in PLC function block diagrams.
- Sizing of pressure safety valves.
- Simulation of a valve failure event.
- Calculation of heating or cooling requirements for various processes.
- Heat loss/pickup calculations.
- Insulation sizing.

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