FLOWNEX®
SIMULATION ENVIRONMENT

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 and NQA1 quality assurance system environment.
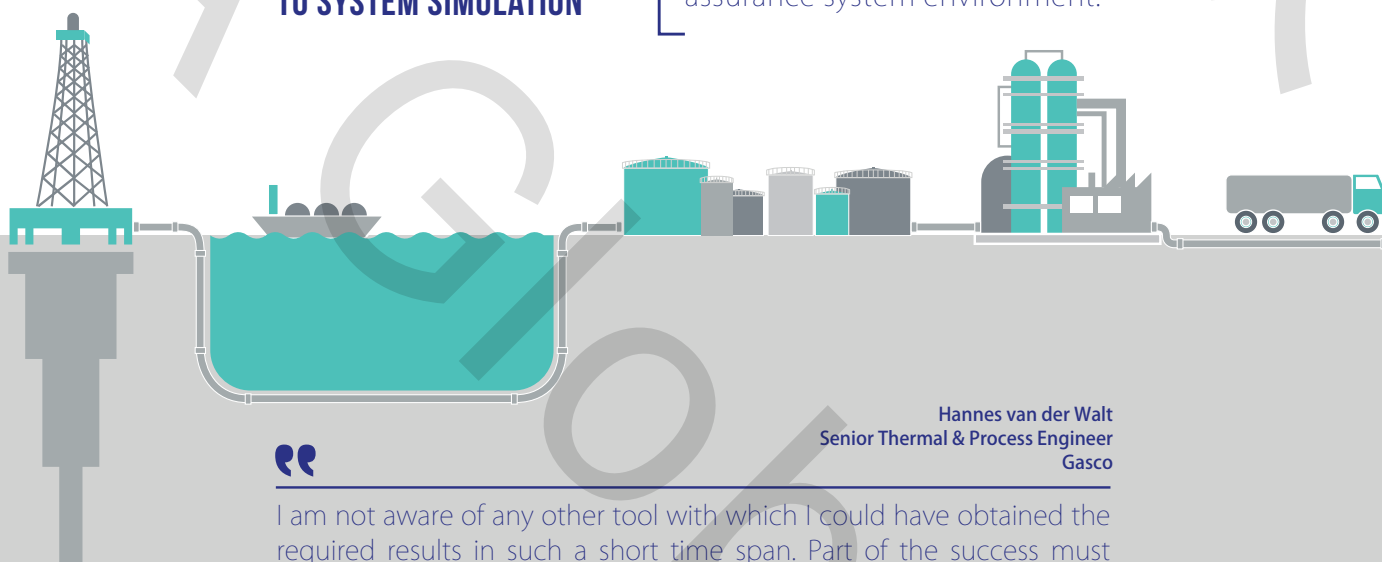
Hannes van der Walt
Senior Thermal & Process Engineer
Gasco

" 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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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.
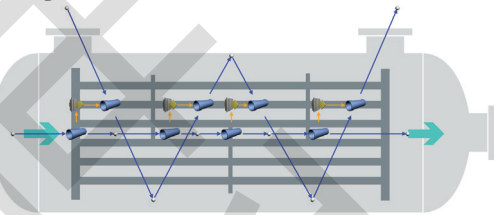
FIRE PROTECTION SYSTEMS
Pump, pipe and tank sizing.
Sizing of nozzles and orifices.
Flow balancing.

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.