

FLOWNEX[®] FOSSIL FUEL SIMULATION ENVIRONMENT **POWER**

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

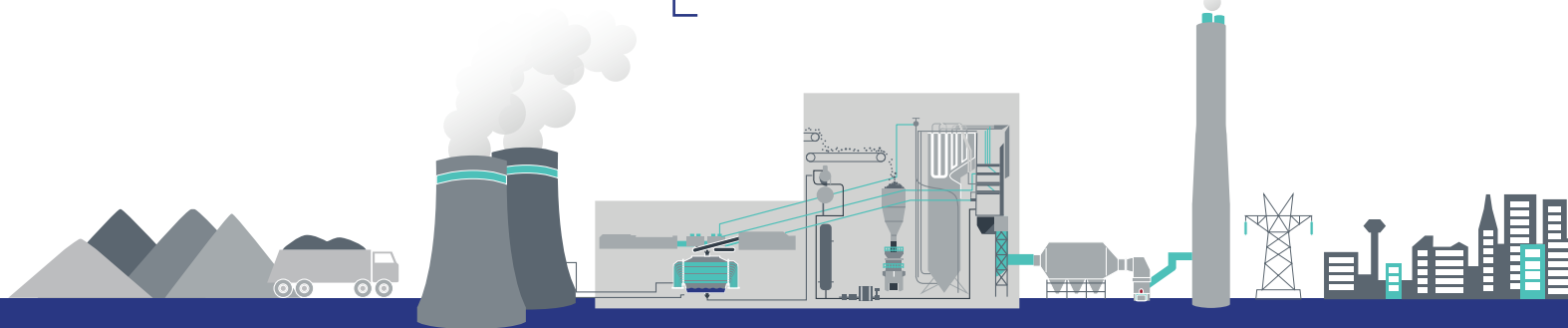
- System sizing.
- Component sizing.
- Determining operating ranges.
- Flow, temperature, pressure, power consumption, etc.
- Testing of control philosophy.

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.



Engineering productivity for the design and analysis of complex thermofluid systems such as those found in large coal fired power plants is vastly improved by modeling in Flownex[®]. In addition, the system knowledge and understanding gained by the modeler is invaluable in subsequent activities.

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See more at enginsoftusa.com/flownex-CFD.html

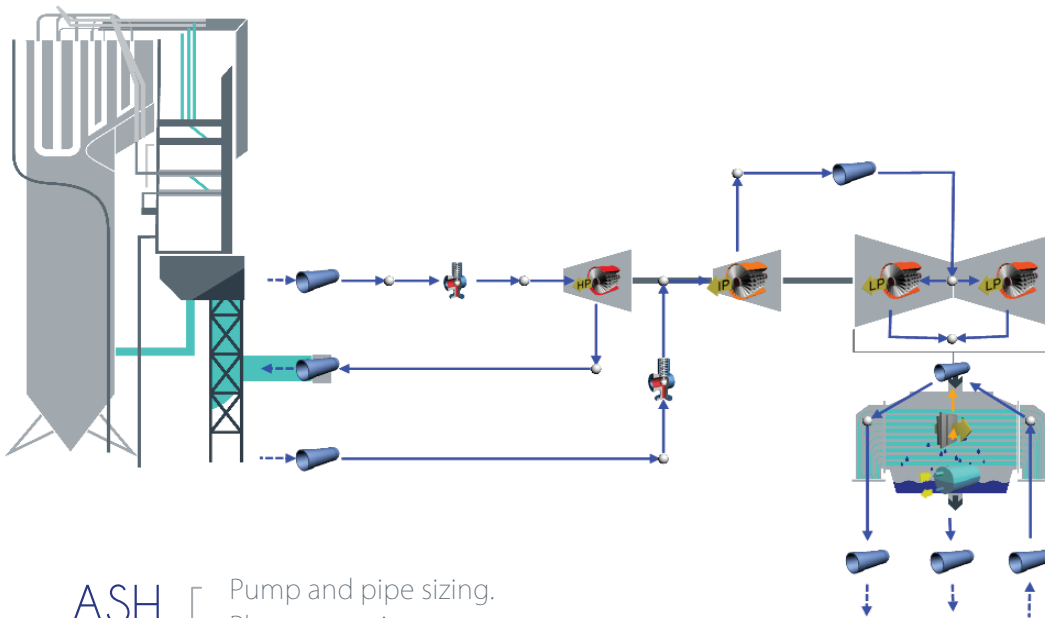


FEEDWATER SYSTEMS

- Pipeline, valve and pump sizing.
- Cavitation, flashing and condensing detection.
- Pump performance and NPSH.
- Feedwater heater performance and tube leaks.
- Flash tank behavior.

STEAM TURBINE & SUPPORTING SYSTEMS

- Start-up, shutdown and load following operation.
- Turbine trip control.
- Gland steam systems.
- Lubrication systems.
- Generator hydrogen and lubrication systems.
 - Assess cooling system and heat exchanger performance.



ASH SLURRY

- Pump and pipe sizing.
- Plant expansion.
- Slurry settling and blockage.

NATURAL CIRCULATION BOILER

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

COOLING WATER CIRCUITS

- Pipeline, valve and pump sizing.
- Water hammer.
- Cooling tower response.
- Heat exchanger sizing.
- Water reticulation flow balancing & energy efficiency.

BOILER STEAM SYSTEMS

- Once-through and reheat boilers.
- Temperature calculation and change rates.
- Boiling stability & boiling regime examination.
- Detection of boiling oscillations (Ledinegg, density wave, pressure drop-type)
- Recirculation rate and steam production.
- Natural circulation boiler.
- Attemperation system.
- Dry out prediction.
- Load changes.

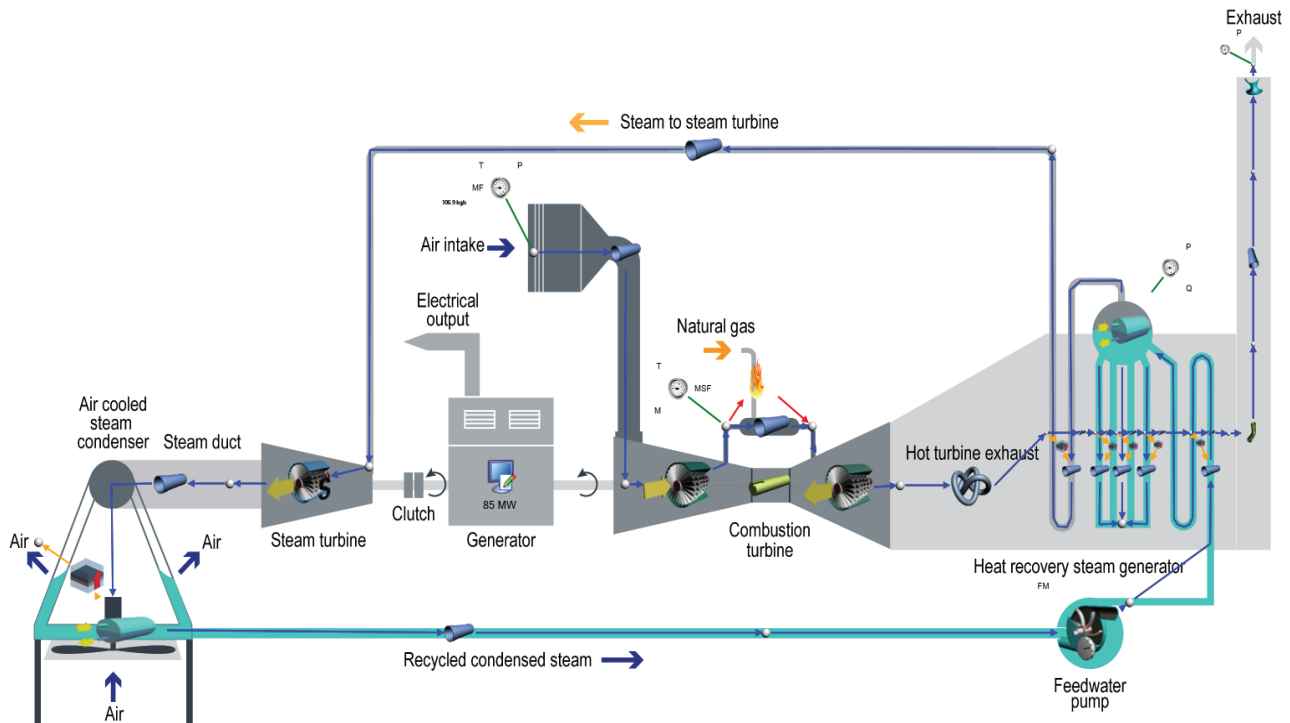
CONDENSERS

- Air leak detection.
- Condenser level following.
- Wet and dry condenser heat exchange.

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COMBINED CYCLE PLANT

- High level analysis and design of the complete combined thermodynamic cycle.
- Transient analysis of load change scenarios.
- Cycle efficiency analysis under different ambient conditions.
- Root cause analysis for fault finding.



BOILER AUXILIARY SYSTEMS

Start-up fuel oil or gas systems.

- Flow balancing in branching networks.
- Pipe heat loss estimation.
- Pump sizing and viscosity adjustment.
- Control philosophy testing.
- Pump/pipe/injector matching.

Draught group/Flue gas system: Calculation of ID or PA fan capacity margin as function of loss characteristics: Pulverisers, air heater seal leakage, flue gas ducts, precipitators, flow regulator vanes, flue gas desulphurization units (FGD).

SOME FLOWNEX®
COMPONENTS FOR
POWER GENERATION USE



SOME
FLOWNEX®
LICENSE
HOLDERS:



Flownex® proved to perform well also for simulations of start-ups (or shutdowns), making it a valuable tool for studying and optimizing such procedures.

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HEAT RECOVERY STEAM GENERATOR & BOILER SIMULATIONS

STEADY-STATE DESIGN

- Analysis of natural circulation boiling sections.
- Modeling and design of the heat transfer between the gas and steam side of a heat exchanger.
- Modeling of the complete system, including superheaters, economizers, evaporators, pumps, turbines, etc.
- Adaptable modeling approach according to the required level of detail.
- Assists in proper and economical design for the expected operational conditions.

TRANSIENT ANALYSIS

- Determine rates of change in material temperatures.
- Evaluate control philosophy.
- Determine plant power ramp rates.

APPLICATIONS

- Detection of unwanted operating conditions involving:
 - Boiling oscillations.
 - Departure of Nucleate Boiling (DNB).
- Evaluation of off-design or accident scenarios.
- Evaluation of temperature gradient during start-up.
- Evaluation of start-up, shut down and load changes.
- Flow stability analysis.
- Flow distribution.
- Balancing of flow in parallel paths.

