

# GateCycle Training

Thermodynamic modeling and Performance Analysis of Power Plants

## About GateCycle

GE's GateCycle is a very flexible software used for design, simulation and performance analysis of all major power plant equipment. It is OEM independent and can be used to model equipment of any manufacturer.

It is extensively used in the power industry for modeling various types of –

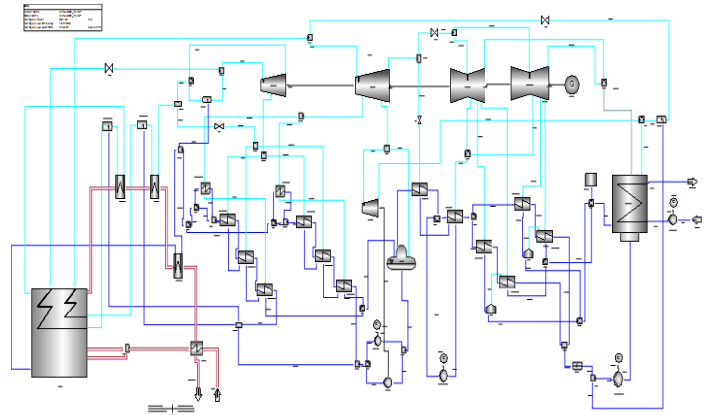
- Simple Cycle plants
  - Industrial Frame Gas turbines
  - Aero Derivatives
- Combined Cycle plants
- Coal fired plants
  - Subcritical
  - Supercritical
- Co-Generation Units
- Mechanical Drives

## About Us

Our Engineers have extensive experience (over 20 years) in various departments of Power Industry including Commissioning, Operations & Maintenance, Thermal Performance Analysis, Thermodynamic modeling, Training etc.

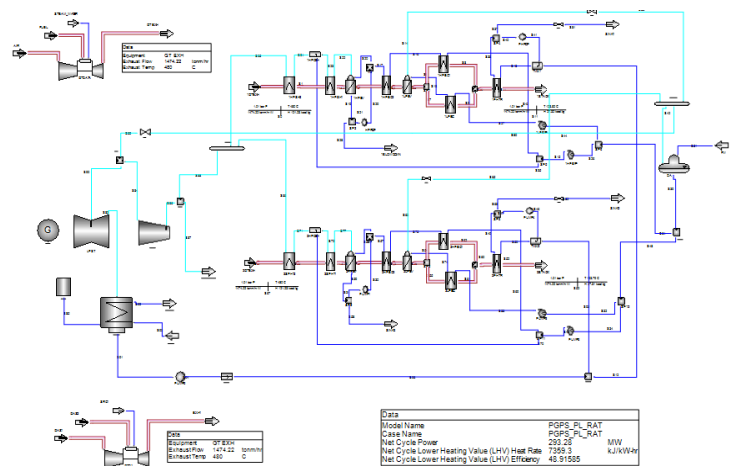
We conducted numerous GateCycle training sessions for various customers in **Singapore, Thailand, USA, Malaysia, Qatar and India.**

Our experience also includes building offline and online performance and optimization solutions using GateCycle software. Such solutions are currently being used to monitor over 4200+ MW of Combined cycle and Coal fired plants.



## Training

Training is “hands on” with various modeling exercises that use real data. Participants can opt for Basic or Advanced training sessions. Training can also be tailored to suit customer requirements based on the area of their work (for example more emphasis is given to Gas turbine and Steam Cycle modeling for customers who deal with combined cycle plants).



## GateCycle – Basic Training

### Day 1 - Fundamentals of GateCycle

- Introduction to GateCycle 6.x version
- Features of GateCycle 6.x
- Thermodynamic modeling Fundamentals
  - Mass and Energy balance
- Model building in GateCycle

### Day 2 – GateCycle calculation engine concepts

- Mass Flow Control
- Pressure feedback
- Customizing calculations
- Model building exercises

### Day 3 – GateCycle Design Vs Off Design concepts

- Design Vs Off Design
  - Using Design information to build GateCycle models
- Macros and Tables
- Model building exercises

### Day 4 – GateCycle – Cyclelink and simulation

- Cyclelink – MS Excel interface for GateCycle
  - Parametric studies and simulation
- Convergence, Tolerance, Triggering macros
- Damping factors
- Typical mistakes in GateCycle modeling and troubleshooting
- Model building exercises

### Day 5 – Model building exercises

- Gas Turbine
- Steam Turbine
- Coal Boiler
- Feed water heaters
- Condenser

## GateCycle – Advanced Training

### Day 1 - Refresh basics of GateCycle

- Mass and Energy balance
- Model building concepts in GateCycle
- Types of models to be built for power plant performance analysis

### Day 2 - Practical approach to power plant thermodynamic modeling

- Identifying design data required for thermodynamic modeling
- Typical data supplied by OEMs
- Accounting for missing design information. Heat balance diagrams & correction curves.
- Identification of tags required for performance analysis – P&IDs

### Day 3 - Detailed component level modeling

- Gas turbine / Coal Fired Unit
- HRSG - section level / Feed water heaters
- Steam turbine - Section level
- Condenser etc.

### Day 4 – Model tuning Concepts

- Validating GateCycle models with design data
- Model tuning with commissioning data to reflect as built equipment at site
- Building full plant models by assembling various components
- Typical problems in Power plants
- Identifying problems using GateCycle outputs

### Day 5 – Sample User Interfaces

- Discuss Automation using CycleLink to create an online performance solution
- Pros and Cons of automating Cyclelink for analysis
- Examples of sample interfaces built in Excel

Sample design information shall be provided as a part of training. Participants are also encouraged to bring their data for discussion.



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