



Training Course:
Gas System Thermal Simulation (GSTS):
Modeling, Analysis & Optimization

13 - 17 September 2026
Cairo (Egypt)

Training Course: Gas System Thermal Simulation (GSTS): Modeling, Analysis & Optimization

Training Course code: SC236655 From: 13 - 17 September 2026 Venue: Cairo (Egypt) - Training Course Fees: 4100 € Euro

Introduction

The [Gas System Thermal Simulation GSTS: Modeling, Analysis & Optimization](#) training program has been designed by [Global Horizon Training Center](#) to provide participants with the technical knowledge and practical understanding required to analyze and simulate the thermal behavior of gas systems.

The program focuses on gas thermodynamics, heat transfer, fluid properties, pressure-temperature relationships, and the thermal behavior of gas pipelines and associated systems. Participants will learn how thermal simulation models are developed, analyzed, and used to evaluate different operating scenarios.

The course also explores steady-state and transient conditions, enabling participants to assess system performance, identify potential thermal constraints, and support safe and efficient engineering and operational decisions.

Training Objectives

By the end of this training program, participants will be able to:

- Understand the fundamental thermodynamic principles governing gas systems.
- Analyze relationships between pressure, temperature, and gas flow.
- Understand gas properties and their impact on system performance.
- Apply heat transfer principles to gas pipelines and associated equipment.
- Understand and develop gas system thermal simulation models.
- Analyze steady-state and transient operating conditions.
- Evaluate the impact of changing operating conditions.
- Interpret thermal simulation results effectively.
- Identify potential thermal and operational constraints.
- Apply simulation results to improve gas system performance and reliability.

Target Audience

This program is suitable for:

- Gas Engineers
- Process Engineers
- Pipeline Engineers
- Mechanical Engineers
- Production Engineers
- Operations Engineers
- Flow Assurance Engineers

- Process Simulation Engineers
- Technical and Engineering Personnel involved in gas systems

5-Day Training Outline

Day 1: Gas Systems and Thermodynamic Fundamentals

- Overview of gas production, processing, and transportation systems
- Gas composition and physical properties
- Pressure, temperature, and flow relationships
- Gas equations of state
- Fundamentals of gas thermodynamics
- Energy balance in gas systems
- Introduction to Gas System Thermal Simulation GSTS

Day 2: Heat Transfer in Gas Systems

- Fundamentals of heat transfer
- Conduction and convection
- Thermal resistance concepts
- Heat exchange between pipelines and surroundings
- Ambient and soil temperature effects
- Pipeline insulation and thermal properties
- Temperature profiles along gas pipelines
- Joule-Thomson effect and gas expansion

Day 3: Gas System Thermal Modeling

- Principles of thermal modeling
- Defining system boundaries
- Establishing operating and boundary conditions
- Gas composition and fluid characterization
- Pipeline and equipment modeling
- Pressure and temperature boundary conditions
- Steady-state thermal simulation
- Model verification and validation

Day 4: Transient Thermal Simulation and Operational Scenarios

- Introduction to transient simulation
- Steady-state versus transient analysis
- Start-up and shutdown conditions
- Changes in gas flow rates
- Pressure and temperature fluctuations
- Line packing and depressurization
- Thermal response of gas pipelines
- Abnormal operating scenarios
- Interpretation of transient simulation results

Day 5: Simulation Analysis and System Optimization

- Evaluation of simulation outputs
- Identification of thermal and operational constraints
- Sensitivity analysis
- Operational scenario comparison
- Evaluation of alternative operating conditions
- Thermal performance optimization
- Troubleshooting using simulation results
- Engineering case study
- Final GSTS simulation exercise and discussion

Registration form on the Training Course: Gas System Thermal Simulation (GSTS): Modeling, Analysis & Optimization

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