



Fundamentals of Process Technology
Training Conference





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Introduction to Process Technology Training Conference:

Process engineering is at the heart of the chemical, oil, gas, and petrochemical industries. The process technology fundamentals conference requires familiarity with chemical engineering principles and many other engineering disciplines, including mechanical, electrical, and instrumentation.

The process engineer is interested in transporting and transforming solids, liquids, and gases. Separation processes are of specific importance, including distillation, heat transfer, hydraulics and fluid flow, reaction engineering, process control, and economics.

Enhancing Process Management and Engineering Technologies:

Process management technology and process engineering technologies are significant in synthesizing the industrial landscape, particularly within oil and gas process technology and gas processing technology.

This process technology fundamentals conference is designed to delve into advancements in these areas, helping professionals familiarize themselves with process technology definitions and fundamental technology systems and gain actionable insights into the application of these technologies.

Targeted Groups:

- Petroleum Engineers.
- Maintenance and Production Engineers.
- Process Engineers.
- R&D Chemists, Plant Chemists.
- Economists and Business Managers.

Conference Objectives:

By the end of this process technology fundamentals conference, the participants will be able to:

- Understand the fundamental principles used in processes and facilities.
- Apply a practical understanding of hydraulics and fluid flow.
- Apply learning from historical safety incidents.
- Perform relevant calculations and analyses to assist in operation, sizing, and troubleshooting.
- Develop a perspective and focus from a company viewpoint on the interaction of different engineering disciplines.

Targeted Competencies:

By the end of this process technology fundamentals conference, the target audience will be able to:

- Practical understanding of essential process units and classes of units involved in separations.
- Heat exchange and reactions.
- Hydraulics and fluid flow.
- Support in operation, sizing, and troubleshooting.

Conference Content:

Unit 1: Introduction and Fundamentals of Process Engineering:

- Process technology certification and process engineering basics.
- Mass and energy balances.
- Batch and continuous processes.
- Reactor types.
- Process equipment and flow diagrams.
- P&IDs.
- Flammability.
- Electrical area classification.
- Risk Management and Hazard Studies.
- Hydraulics and fluid flow.
- Pressure and head.
- Bernoulli's theorem and its field applications.
- Flow of liquids.
- Reynolds number and pressure drop in pipes.
- Two-phase and multi-phase flow.
- Enthalpy and thermodynamics.
- Principle of process relief devices and process design of relief systems.
- Principles of pressure vessel and piping design.
- Pumps.
- Compressors.
- Mixers.
- Mechanical Equipment - Types and application guidelines.

Unit 2: Heat Transfer and Reaction Engineering:

- Heat Transfer.
- Thermal conductivity.
- Conduction and convection.
- Insulation.
- Heat transfer coefficients and calculation.
- Heat exchangers, type, and sizing.
- Steam reboilers.
- Condensers and sub-cooling.
- Introduction to energy recovery.
- Catalysis and Reaction Engineering.
- Chemical reactions.
- Reaction kinetics.
- Introduction catalysis.
- Green Chemistry and Engineering.
- Reactor Design and Operation.

Unit 3: Distillation Processes and Equipment:

- Distillation basics.
- Phase behavior and vapor/liquid equilibria.
- Gas/Liquid separation.
- Distillation equipment - Columns and vessels.
- Columns and vessels - Sizing and selection guidelines.
- Column and vessel internals - Types and selection guidelines.
- Troubleshooting of process equipment.

Unit 4: Separation Processes and Equipment:

- Overview of Other Separation Processes.
- Absorption and adsorption.
- Amine sweetening.
- Solid Liquid separation.
- Effluent treatment [in refinery and petrochemical] industries.

Unit 5: Process Control and Economics:

- Introduction to Process Control Technology.
- Classification of control systems.
- Measured variables.
- Simple feedback control.
- Process Economics.
- Preliminary economic analysis.
- Fixed and variable costs, break-even analysis.
- Calculating raw materials usage.
- Estimating the cost of process equipment and plants.