# Operation of Process Equipment

## Energy Milestones Corporation

### Advancing Professionals to the next level

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# Operation of Process Equipment

## Overview

This course is designed to provide an understanding and skills in the operation of process equipment and troubleshooting. The program is a good opportunity for participants to familiarise themselves with practical techniques and functional criteria (including shortcuts) for designing and troubleshooting process equipment commonly used in gas processing and petrochemical plants.

## Course Objectives

- Calculate, evaluate, and compile process data for the specification, design, selection, and operation of process equipment.
- Possess enhanced skills and knowledge in process engineering, including design methods, criteria, calculation procedures and shortcut techniques.
- Perform the evaluation, diagnostic monitoring and troubleshooting of existing process equipment, including de-bottlenecking and revamping methods.
- Evaluate technical proposals and prepare scoping cost estimates
- Prepare comprehensive process specification documents for bid packages

## Course Content

1. Introduction
   - Course overview
   - Gas processing overview
   - Process equipment categories
   - Mechanical and safety aspects

2. Process Control and Instrumentation
   - Instrumentation types and selection
   - Control valves sizing and selection
   - Pressure relief devices and systems

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## Course Content

### 3. Piping

- Fluid flow principles
- Pressure loss categories
- Pipe properties
- Sizing methods and criteria
- Two-phase flow

### 4. Conventional Separators

- Types and functions
- Sizing criteria and method
- Design considerations and internals
- Process operating problems

### 5. Pumps

- Categories and types
- Performance characteristics
- Control systems
- Design criteria and parameters
- Pump selection guidelines

### 6. Compressors

- Categories and types
- Compression process
- Characteristics and terminologies
- Design Criteria and Parameters
- Compressor control methods
- Selection guidelines
- Drivers
- Process operation problems/troubleshooting

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## Course Content

### 7. Fired Heaters

- Heater types
- Process applications
- Selection guidelines
- Process operating problems

### 8. Heat Exchangers

- Heat exchanger types
- Process applications
- Heat transfer terms and equations
- Design criteria and parameters
- Fouling considerations
- Reboilers
- Calculation methods
- Selection guidelines
- Process operation problems/troubleshooting

### 9. Air Coolers

- Air cooler types
- Design and operating considerations
- Process operating problems/troubleshooting

### 10. Fractionation Columns

- Fractionator types
- Process design methods
- Trays vs packing
- Operating parameters
- Process operating problems/troubleshooting

# Operation of Process Equipment

## Targeted Audience

This course is intended for those involved in process engineering, instrumentation & and control, including process engineers, mechanical & equipment engineers, project engineers, maintenance engineers, operators, and technicians.

## Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games