

### Training Title

## **FUNDAMENTALS OF PROCESS & MECHANICAL ENGINEERING**

### Training Duration

5 days

### Training Dates & Venue

REF ME072	Fundamentals Of Process & Mechanical Engineering	5	09 – 13 Sept '18	\$4,250	Dubai, UAE
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Training will be held at any of the 5 star hotels. The exact venue will be informed once finalized.

### Training Fees

- 4,250 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

### Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

## **TRAINING OVERVIEW**

### TRAINING DESCRIPTION

This 5 day course will provide an overview of the various process Systems, key selection considerations and how they are integrated into industrial facilities. Individuals will develop a basic understanding of the wide variety of process systems and components and how they integrate with the process facilities and overall operation. System selection, relative costs and other managerial decisions pertinent to utility operations are covered. Exercises are used to identify process and utility consumers, summarize utility requirements, consider high level process / utility systems options, and select the most energy efficient alternatives from an industrial perspective Pressure vessels, heat exchangers, aboveground atmospheric storage tanks, and piping systems typically represent over half the capital investment in a process plant. These fixed equipment's and piping systems are subject to a number of damage mechanisms throughout their service life that could result in serious or even catastrophic failures. Effective inspection strategies and programmes are required to monitor the condition of these fixed equipment and piping systems, to assess their fitness for continued service, make repair/replace decisions, and develop appropriate cost-effective repair methods This course is structured to provide the delegates with the appropriate mix of technical fundamentals and practical best practices to maximize their learning.

### TRAINING OBJECTIVES

Apply the requirements of the relevant industry standards and practices to the inspection and maintenance of pressure vessels, heat exchangers, piping systems, and aboveground atmospheric storage tanks and rotating equipment and power generation equipment. Develop inspection and maintenance programs for process plant equipment and piping systems. Prepare appropriate details for repairs and alterations to process plant equipment and piping systems

### WHO SHOULD ATTEND?

Facility Engineers or engineers new to process/ utility systems who are responsible for designing, operating and maintaining process / utility systems in industrial and power generation facilities. Most operations and planning activities depend on a fundamental knowledge of process and utility systems. This important subject is frequently overlooked however it is vital to successful company operations. Attending this course will assist participants in developing a broad background in process/ utility systems

### TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. The delegates will also be encouraged to raise their own questions and to share in the development of the right answers using their own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

### DAILY OUTLINE

#### Day 1 Problem solving and Decision Making

##### Introduction

- Definitions
- Problem Identification
- Problem Solving Model
- Decision Making Techniques

#### Cause & Effect Diagram (Fish bone Diagram) description and understanding

#### Case Study

##### Process equipment's

- Rotating equipment similarity
- Auxiliaries

- Troubleshooting

## Day2 Process fundamentals

- Process heating systems:
  - Steam
  - Hot oil
  - Glycol
  - Water
- Process cooling systems:
  - indirect
  - cooling water
  - direct-seawater
- Process drains
  - open
  - closed
- Refrigeration
  - Theory & Function
  - Application
- Power
  - Generation
  - Distribution
- Air Plant
  - Instrument air
  - Breathing air
- Water
  - Fresh & potable producing
  - storage
- Fuel systems:
  - Natural gas,
  - Diesel
- Firewater
  - System
  - Pumps station
- Inert gas systems
- Utilities energy considerations

## Utility management issues systems

- Process control systems
- Chemicals and additives
- Safety systems and functional safety
- Emergency shutdown and process shutdown
- Fire and gas system
- Control and safety configuration

## Day 3 Process Rotating Equipment

- Pumps
  - Fresh water
  - Sea water
  - Chemicals
- Compressors
  - Air compressor
  - Drier
- Fans
  - Axial and centrifugal

## Day 4 static equipment

- Vessel and tanks
  - Types
  - function
- Heat exchanger
  - Types
  - applications
- Valves
  - Types
  - Uses and application
- Direct Fired Heaters
- Pipelines
  - Schedule and classes
  - Gas Pipelines, compressor and valve stations
  - Liquid pipelines, pump and valve stations
  - Pipeline management, control and safety

## Day 5 Power generation, distribution and drives

- Gas turbine
  - Components
  - Auxiliaries
  - Function and efficiency
  - Flare and atmospheric ventilation
- Diesel engine
  - Components
  - Operation and maintenance
- Motors
  - Types
  - Operation

Case Studies, Group Discussions, Last Day Review, Assessments will be carried out.

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