ICTD
المركز العالمي للتدريب والتطوير
International Centre For Training & Development

MUE125

Mechanical Engineering:

Design, Selection, Installation & Commissioning of Mechanical Equipment

Course Introduction:

Rotating equipment, pressure vessels, aboveground atmospheric storage tanks, and piping systems represent major capital investment in a process plant. Good design and construction is required as these equipment and piping systems are subject to a number of damage mechanisms throughout their service life that could result in serious or even catastrophic failures. This course is structured to provide the delegates with the appropriate mix of technical fundamentals and practical best practices to maximize their learning.

Course highlights:

- Discussion of static and rotating equipment
- Design of petrochemical plant
- Specification of petrochemical plant.
- Discussion of the construction stages

Sample problems and participant exercises are included throughout the course to illustrate the concepts discussed and provide the delegates with practice in applying them

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Understand the requirements of the relevant industry standards and practices
- ✓ Develop an understanding of the design and construction of rotating equipment, pressure vessels, piping systems, and aboveground atmospheric storage tanks into complete systems.
- ✓ Develop an understanding of commissioning procedures and techniques
- ✓ Understand how operations and maintenance interact
- ✓ Develop an awareness of construction and inspection techniques
- ✓ Develop the use of management tools for mechanical equipment operation and maintenance

Who Should Attend?

This course is intended for graduate engineers, operations engineers, maintenance engineers, maintenance & engineering supervisors and all engineers and team leaders in order to give them a practical understanding of real world situations in a mechanical petrochemical project and construction environment.

Course Outline:

Day 1:

Rotating Equipment

- Pumps & Compressors
  - Positive displacement
  - Centrifugal action
- Pump & Compressor Performance
  - Pump curves
  - Compressor maps
  - System curves
- Selection & Specification
  - Fulfilling process requirements
  - System integration

Day 2:

Static Plant

- Piping, Pipelines & Pressure Vessels
  - ASME B31 codes for piping
  - ASME BPVC VIII for pressure vessels
  - Pressure relieving devices
- Above Ground Storage Tanks
  - API 650 for ASTs
  - AST construction
- General Construction Considerations
  - Fabrication techniques
  - Resource logistics
  - Working with contractors

Day 3:

Materials & Construction

- Material Properties
  - Physical properties
  - Testing
  - Material specification data
- Welding

- Techniques
- Qualification & procedures
- Approval & quality

- Inspection & Testing
  - NDE techniques: VT, PT, ET, MP, RT, UT
  - NDT techniques: hydrotest & pneumatic test

Day 4:

System Design

- Process Flow Schemes & Process Engineering Flow Schemes
  - Overview
  - DEP requirements
  - Process design & instrumentation
- Commissioning
  - Preparatory checks
  - Protocol development
  - Startup/Shutdown/Handover
- Plant & Equipment Operability
  - Operations consideration
  - Maintenance considerations

Day 5:

Specifications

- Procurement Requirements
  - Material & Performance specifications
  - Supporting Standards: regulatory & in-house
  - Project schedule
- Measure the Success
  - KPIs for the mechanical engineer
  - Benchmarking

Course Certificate:

International Center for Training & Development (**ICTD**) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee/Tea
08:20 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Coffee/Tea/Snacks)
13:30 - 15:00	Last Session