

# **PETROCHEMICAL PROCESS PLANT EQUIPMENT SIZING & SELECTION**



**PCE135  
Process and  
Chemical  
Engineering**

**COURSE TITLE**

**PETROCHEMICAL PROCESS PLANT EQUIPMENT SIZING & SELECTION**

**COURSE DATE/VENUE**

1<sup>st</sup> – 5<sup>th</sup> June 26'

Tbilisi, Georgia

**COURSE REFERENCE**

PCE135

**COURSE DURATION**

05 Days

**DISCIPLINE**

Process and Chemical Engineering

**COURSE INTRODUCTION**

Petrochemical industry is one of the expanding industries all over the world due its high profit and quick turn over. It needs huge investments to fulfill its requirements which are mainly sophisticated equipment like thermal equipment (boilers, heat exchangers, fired gas heaters), rotating equipment (pumps, turbines, gas compressors, air blowers), catalytic chemical reactors and gas reformers. The course presents the major types of these equipment and highlights their recent technological aspects for installation, operation, maintenance & troubleshooting.

The seminar covers how these equipments operate and provides guidelines and rules that must be followed for a successful operation. Their basic design, operating characteristics, specification, selection criteria, installation and commissioning requirements, advanced fault detection techniques, critical components as well as all their maintenance and troubleshooting methods are covered in detail. This seminar also covers advanced maintenance techniques such as “Used Oil Analysis”, and “Vibration

Analysis” in detail.

## **COURSE OBJECTIVE**

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

- ✓ Provide a comprehensive understanding of the various types of centrifugal and positive displacement pumps, compressors, valves, actuators, and bearings. Participants will be able to specify, select, commission and maintain this equipment for their applications.
- ✓ Describe the benefits of advanced maintenance techniques such as “Used Oil Analysis”, and “Vibration Analysis”.
- ✓ Achieve reduced capital, operating and maintenance costs along with increase in efficiency.
- ✓ Lay out the major types of process plant equipment
- ✓ Enable attendees to grasp the advanced information in basic design issues for major equipment
- ✓ Present the main requirements for installation concerning each type of equipment
- ✓ Illustrate the importance of good operability for each type of equipment
- ✓ Clarify the vital role of different types of maintenance regimes in successful and continuous production operation
- ✓ Present examples of troubleshooting through some case studies

## **COURSE AUDIENCE**

Engineers of any discipline, managers, technician, technologists, and other technical personnel.

## **COURSE CONTENT**

- Pumps
- Centrifugal pump mechanical seals
- Positive displacement pumps
- Diaphragm pumps
- Pump selection

- Pumping system calculations
- Compressors
- Centrifugal and axial compressors
- Compressor auxiliaries, off-design performance, stall and surge
- Intelligent (smart) transmitters
- Advantages of Intelligent Instrumentation
- Stand-alone controllers
- Fieldvue digital valve controller type dvc5000 series
- Fieldvue instruments
- Control valve cavitation
- Actuators, positioners and accessories
- Frequently asked questions
- Bearings
- Used oil analysis
- Vibration analysis, predictive maintenance and diagnostic testing

### **Thermal Equipment**

- Package boilers
- Waste heat boilers
- Fired gas heaters
- Heat exchangers
  - Basic design of different types
  - Installation requirements
  - Safe operation
  - Maintenance and Inspection
  - Troubleshooting (case study)

### **Rotating Equipment**

- Pumps
- Turbines
- Gas Compressors

- Air Blowers
  - Basic fundamentals and characteristics of each type
  - Installation requirements
  - Monitoring equipment condition through vibration analysis, bearing temperature & lubricating oil analysis
  - Applying predictive maintenance regime
  - Troubleshooting (case study)

### **Catalytic Chemical Reactors**

- Shift Converters
- Synthesis Gas Reactors
  - Basic design issues
  - Installation requirements
  - Internals & catalyst beds assembly
  - Material selection
  - Inspection applications
  - Troubleshooting (case study)

### **Gas Reformers**

- Fired box/tube reformer
- Cylindrical vessel reformer
  - Basic design issues
  - Installation requirements
  - Material selection
  - Lining systems& material selection
  - Maintenance & inspection applications
  - Troubleshooting

### **COURSE CERTIFICATE**

**TRAINIT ACADEMY** will award an internationally recognized certificate(s) for each delegate on completion of training.

## **COURSE FEES**

£5,500 per Delegate. This rate includes participant's manual, Hand-Outs, lunch, coffee/tea on arrival, morning & afternoon of each day.

## **COURSE METHODOLOGY**

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions