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Fundamentals of

# PROCESS PLANT LAYOUT and PIPING DESIGN



## YOU WILL LEARN:

At the end of this workshop delegates will understand:

- Plant Layout fundamentals and procedures
- Fundamental principles of Chemical Process Technology
- Terminology and symbols used in plant layout
- Equipment used in process plants
- Piping Design and Engineering principles
- Terminology, Symbols and Abbreviations in Piping Design
- Documents (Bill of Materials, Equipment Specifications, etc.) and Drawings (PFDs, P&IDs, etc.) used in plant layout and piping design
- 3D modeling of plants and piping systems

## WHO SHOULD ATTEND:

This course is designed for personnel who want to understand the design and engineering principles involved in process plant layout and piping design. Those who will benefit the most from this workshop include the following:

- Personnel from EPC (Engineering, Procurement and Construction) companies
- Chemical (Process) Engineers
- Mechanical Engineers
- Piping Designers and Piping Engineers
- Project Engineers
- Personnel providing CAD support for Plant Layout and Piping Design
- Designers and Engineers involved in Instrumentation and Control of Process Plants
- Equipment Designers and Engineers
- Structural Designers and Engineers
- Electrical Designers and Engineers
- Consulting Engineers
- Plant Maintenance Personnel



*Technology Training that Works*

## THE WORKSHOP

The process plant layout and piping design course is a comprehensive, highly practical and interactive two-day course. You will have an opportunity to learn and discuss the techniques and procedures used in the design and engineering of complex process plants. You will learn the fundamentals of plant layout, the equipment used, design principles and procedures. You will also learn the fundamentals of piping system components and the specification and design of these components. Practical examples from actual projects will be used extensively to illustrate the principles and drive home the point. You will also be provided with a high quality course manual that IDC is known for. This course manual will be useful for many years after the course.

## WORKSHOP OBJECTIVES

Process plants, such as refineries and petrochemical plants, are complex facilities consisting of equipment, piping systems, instruments, electrical systems, electronics, computers and control systems. The design, engineering and construction of process plants involves multidisciplinary team effort. Plant layout and design of piping systems constitute a major part of the design and engineering effort. The objective is to design safe and dependable processing facilities in a cost effective manner. The fact is that there are few formal training programs with a focus on plant layout and design of piping systems. Therefore, most of the required skills are acquired while on the job, reducing productivity and efficiency.

This course will cover the fundamental principles and concepts used in process plant layout and piping design. Upon completion of this course the attendees will have a clear understanding of the design and engineering principles used in plant layout and piping design. The outcome will be a work force with the required skills and faster learning curves with minimal on the job training. This will increase productivity and shorten engineering and construction schedules. The process plants will get on stream quicker and operate with increased safety and reliability, satisfying the needs of the client.

## THE PROGRAM

### DAY ONE

#### MODULE 1

##### Introduction to Process Plant Layout and Piping Design

- Plant layout fundamentals
- Procedures and workflow
- Physical quantities, units, trigonometry

#### MODULE 2

##### Introduction to Chemical Processing Methods

- Unit operations and unit processes
- Process flow diagrams (PFDs)
- Utilities

#### MODULE 3

##### Equipment Used in Process Plants

- Process equipment - reactors, towers, Exchangers, vessels
- Mechanical equipment - pumps, Compressors, turbines
- Equipment drawings, nozzle specifications, Vendor drawings
- Equipment foundations and supports

### DAY TWO

#### MODULE 4

##### Plant Layout and Plot Plans

- Plant layout specifications
- Codes
- Safety considerations
- Plot plans
- Equipment arrangement drawings

#### MODULE 5

##### Process and Instrumentation Diagrams (P&IDs)

- Instruments and instrument symbols
- Control valve manifolds
- Meter runs

#### MODULE 6

##### Plant Layout and Piping Design Documentation and Tools

- Line lists
- Equipment lists
- Bill of materials
- P&IDs
- Piping isometrics
- 3D models
- Piping specifications
- Piping codes

### DAY THREE

#### MODULE 7

##### Fundamentals of Pipe

- Pipe dimensions
- Pipe data
- Pipe joining methods
- Pipe representation
- Common abbreviations

#### MODULE 8

##### Piping System Components

- Fittings - elbows, tees, reducers, end caps
- Fitting makeup and dimensions
- Flanges
- Valves
- Pipe racks
- Pipe supports
- Anchors, guides

#### MODULE 9

##### Pipe Routing

- Piping isometrics
- Piping plans, sections, elevations
- 3D representation

### SUMMARY, OPEN FORUM & CLOSING

### COMPLETE POST WORKSHOP QUESTIONNAIRE

## ON-SITE TRAINING

- ✓ **SAVE** over 50% by having an IDC workshop presented at your premises.
- ✓ Customise the training to **YOUR** workplace.
- ✓ Have the training delivered when and where you need it.

Contact us for a **FREE** proposal.