



# WILLPOWER

## Technologies

## Basic Piping Training

This Training will familiarize you with all aspects of piping systems including:

### A. Piping Skill Development

#### 1. Basic Lettering

- Writing Numbers
- Writing Letters

#### 2. Understanding of Piping Bulk Materials & Special Components/Piping Component Dimension Table

##### *2.1 Piping Bulk Materials*

###### A.PIPES

###### B.FITTINGS

- 90 degrees elbow
- 45 degrees elbow
- Straight tee
- Reducing tee
- Concentric reducer
- Eccentric reducer
- Cap
- Coupling
- Olet

- Plug
- Union
- Flange
- Blind flange
- Gasket
- Bolt & nuts

### C. VALVES

- Gate valve
- Globe valve
- Ball valve
- Check valve
- Other types of valves

## *2.2 Special/miscellaneous Components*

- Spectacle blind
- Orifice flange
- Strainer (Y- type, T- type, and Bucket type)
- Steam trap
- Sight glass
- Ejector
- Flame arrester
- Silencer
- Rupture disc
- Air trap
- Hose rack
- Hose reel
- Hose connector
- Emergency shower
- Eye washer
- Hydrant
- Injection nozzles
- Flexible metal tubes
- Drip funnels
- Sprinkler head
- Monitor
- Air foam chamber

## *2.3 Piping Component Dimension Table*

### 3. Equipments/Vendor data

### *3.1 Equipment Types and Functions*

- a. Horizontal Drums
  - b. Vertical Drums and Columns
  - c. Reactors
  - d. Platforms, Ladders, and Pipe Supports
  - e. Heat Exchangers
  - f. Pumps
  - g. Compressors
  - h. Tanks
  - i. Representation of Equipments in Sample P&ID
4. Piping Terminologies / Abbreviations

## B. Piping Basic Design Data and Standards

### *1. Familiarization with the piping codes and standards*

- International Codes and Standards
- Refinery Codes and Standards

### *2. Uses of material Specification*

- Branch Table & Reducing Table
- Line Class & Line Class Index
- Detail Material Specification (sorted by line class)
- Line Class Notes

### *3. Reading of Piping and Instrument Diagram*

#### 3.1 Legends

- Piping Symbols
- Equipment Symbols
- Fluid Code
- Instrument Symbols
- Abbreviations

#### 3.2 Typical Piping Arrangements

- Sampling Connection
- Steam Trap
- LC/LG Arrangement
- PG Arrangement
- Drain and Vent

### 3.3 General Notes

3.4 Free draining, Sloped line, No pockets and Gravity flow

## 4. Preparation and Uses of Line Index

- Preparation Procedure
- Full Line Number
- Entry of Line Data
- Uses of Line Index

## C. Piping Drawings and B/M

### *1. Piping Drawings*

#### 1.1 Drafting Standards

- Lines and Letters
- Dimensions
- Supplemental Items for Indication on Piping Drawings
- Indication of Piping Components
- Pipe Supports
- Process Equipments
- Structures and Buildings
- Instruments

#### 1.2 Procedure of Preparing Plan Drawings

#### 1.3 Interpretation of Plan to Isometric Drawings

#### 1.4 Preparation of Isometric Drawings

#### 1.5 Explanation of Typical Details and Standard Drawings

#### 1.6 Uses of Standard Pipe Support

### *2. Piping Material Take – Off (Bill of Material)*

## D. Piping Flexibility

### 1. Stress Analysis

- Specification for Flexibility Analysis
- Preparation of Sketches for Calculation
- Computer Input
- Evaluation of Result

## E. Computer Training

### 1. 2DD

- Isometric Drawing Preparation
- Plan Drawing Preparation

### 2. Others

## F. Piping Detail Engineering Design

### 1. *Piping Layout*

- 1.1 Around Pumps
- 1.2 Around Exchanger
- 1.3 Around Pipe rack
- 1.4 Around Offsite Area (Tankage and Sleeper Way)
- 1.5 Around Tower
- 1.6 Around Drums
- 1.7 Around Air Fin Cooler
- 1.8 Around Loading and Unloading Facilities

### 2. *Design Information*

- 2.1 Loading Calculation for Concentrated Load, Uniform Load and Unit Load.
- 2.2 Information for Civil

- Pipe Sleeper
- Table Top
- Pump Foundation Data
- Pipe Support
- Pipe Trench
- Drip Funnel
- Penetration Hole at Dike and Road Crossing
- Embedded Plate in Concrete.

### 2.3 Information for Structural

- Pipe rack
- Structure
- Pipe Support
- Access Platform
- Walkway
- Pipe Bridge

## 2.4 Equipment Information

- Platform Lug and Ladder
- Installation Level
- LC and LG Arrangement

## PIPING TRAINING

- Piping Introduction
- Overview of Pipe Design and Drafting

### PIPE FITTINGS

- Elbows
- Coupling
- Reducer
- Tee
- Olet
- Cap

### FLANGES

- Flange types
- Flange ratings
- Flange facings
- Bolts
- Gaskets

### VALVES

- What is valve
- Common valve types
- Valve operations

### SPECIAL/MISCELLANEOUS COMPONENTS

- Spectacle blind
- Strainer (Y- type, T- type, and Bucket type)
- Steam trap
- Sight glass
- Ejector
- Flame arrester
- Silencer

- Hose connector
- Emergency shower

#### MECHANICAL EQUIPMENTS

- Types of equipments
- Equipment terminology
- Nozzle orientations

#### CODES & STANDARDS

- Familiarization with the piping codes and standards
- International Codes and Standards  
Refinery Codes and Standards

#### PIPING ISOMETRICS

- What is isometrics
- Piping isometrics extraction
- Bom (bill of material)
- Material specifications for pipes & piping components.

#### PIPE RACK

#### PIPE SUPPORTS

- Guide support
- Trunnion
- Anchor
- Hangers/ Spring support
- Shoe Support & etc.

#### PROJECT WORK

- Study of P & id , vendor Drawing, data sheet
- Pipe Design Thumb Rules
- Preparation of piping GAD'S
- 3D Generation.
- Piping Software

- Resume Preparation
- Guide lines for interview questions
- Personality development

