

Institute of Piping Engineering & Building Services

PIPING DESIGN & ENGINEERING PER ASME B 31 Codes



IPEBS – INSTITUTE OF PIPING ENGG. & BUILDING SERVICES
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Institute of Piping Engineering & Building Services

OVERVIEW – Process Piping Design & Engineering per ASME B31.3

This is a fast-paced program designed to present all major topics relative to the design and operation, Installation, & Maintenance of Process Piping integrated with Process Plant Layout, Pipeline Design, Stress Analysis and Piping Drafting. The program duration is 45 days Full time Instruction including concept theory, problem solving, system design, CAD drafting and exposure to Industry Leading Pipe Stress Analysis Software's and other Piping Tools.

WHAT YOU SHOULD BRING

Course participants should bring an open mind, a thirst for knowledge, a scientific calculator, sketch pad, pen and long book.

Description

This certificate program introduces the full range of Process Piping Design from Fundamental of Process Piping Layout. Components, Process Flow Diagrams, P & ID's, Pressure Design of Process Piping & Components, Stress Analysis, Flexibility Analysis, Piping Drafting & Routing, Process Piping Maintenance, Installation & Repair. Each topic is presented so as to demonstrate the "real world" impact of design decisions on resulting system performance. Numerous examples of actual designs are presented. (See the "Course Outline" section for details of topics.)

What You Will Learn

Design, Installation & Maintenance of Process Piping inclusive of Chemical plant, Petroleum refinery, Gas Processing plant, Petrochemical, Pharmaceutical, Textile, Paper, Semiconductor & Cryogenic Plants per ASME B 31.3*

WHO SHOULD ATTEND

- Mechanical/Electrical/Chemical/Petroleum Engineers and Students
- Technicians
- Draftsmen

Training Features

- Excellent Material Provided (Design Manual, Design Charts)
- Industry Leading Software's Used in Training.
- Individual Attention & Placement Guidance.
- Hundreds of Students placed in India, Middle East, Far East & African Countries.

PROCESS PIPING/PLANT/PIPELINES DESIGN & ENGINEERING–ASME B 31 Codes

Piping Fundamentals

Introduction, Pipe Dimensions, Pipe Data, Piping Materials & Selection, Codes & Standards, Fabrication & Installation, Piping Joints. Common Abbreviations. Design Documents, Design Bases

Piping System Components

Piping Layout, Piping Fittings - elbows, tees, reducers, end caps, Stub Ins, Flanges, Gaskets, Selection & Application of Valves, Pipe Racks, Pipe Supports, Anchors, & Guides, Thermal Insulation.

Valves, Flanges & Gaskets

Valves Types, Selection and Application, Control Valves, Valve Operators, Flange Types, Facings, Ratings, Gaskets & Bolts.

Process Plant Layout & Engineering

Definition, Basics of Plant Layout Design and Fundamentals. Plant Layout Specifications, Standard Specifications & Data Sheets for Process Equipments. (Vessels, Pumps, Heat Exchangers).

Process Plant Equipments

Process equipment - Reactors, Towers, Exchangers, Pressure Vessels, Drums, Furnaces, Process Liquid Storage Tanks, Mechanical equipment - Pumps, Compressors, Turbines

Pipe Routing & Drafting

Piping Symbols, Flow Diagrams, Piping Isometrics, General Arrangement Drawings – Sections and Elevation, Detail Drawings, Plot Plans, 3D Representations

Process & Instrumentation Diagrams (P&ID's) / Process Flow Diagrams

Purpose of P&ID's, Stages of Development of P & ID's, Symbolism & Conventions, Process & Instrument Drawings, Process Equipment Relationships, Process Industry Practices.

Purpose of PFD's, Symbolism & Conventions for PFD's

Introduction to ASME Codes & Standards

Codes, Specifications, Abbreviations, Piping Abbreviations, Specification Classes

Equipment Layout

Plant Co-ordinate System, Unit Plot Plan, Site Plans, Equipment Location Drawing, Foundation Location Drawings, Piping Drawing Index.

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Piping Stress Analysis

Stress – Strain Relationship, Stress Analysis, Why Piping Components Fail, Stress Categories (Thermal Stresses, Longitudinal Stress & Hoop Stress), Classification of Loads – Sustained / Occasional Loads , Allowable Stresses, REQUIREMENTS OF ASME B31.3 (PROCESS PIPING CODE)

Piping Stress. Causes. Impacts. Layout solutions for weight, thermal and other stresses.

Pressure/Mechanical Design of Process Piping per ASME B31.3

Pipe Wall Thickness Calculations, Maximum Allowable Operating Pressure (MAOP), Design Conditions, Design Pressure, Design Temperature

Pressure/Mechanical Design of Piping Components per ASME B31.3

Pipe, Elbows, Miter Bends, Reinforcement Pad Calculations, Branch Connections, Closures, Flanges, Blanks, Reducers, Expansion Joints, Gaskets.

Pressure/Mechanical Design of Liquid Hydrocarbons Pipelines per ASME B31.4 and Gas Pipelines and Piping Systems per ASME B31.8

Piping Flexibility Analysis

Displacement Stresses & Strains, Formal Analysis, Flexibility Stresses, Reactions

Fluid Handling – Fluid & Flow Classification, Governing Equations, Energy Losses, Compressible Flow, Incompressible Flow, Unsteady Flow. Head Loss Calculations. Laminar & Turbulent Flow, Fanning Friction Factor.

Piping System / Standard Piping Details

Plant Utilities, Utility Stations, Meter Runs, Sewer and Underground Piping Systems.

Pipe Rack Spacing, Pipe Flexibility, Heat Expansion, Anchors, Shoes, Guides, Field Supports, Dummy Supports, Hanger Rods, Spring Hangers

Overview of Pressure Vessel Design and Power Piping per ASME B 31.1

Process Plant Piping System Repair & Maintenance, Examination, Inspection & Testing

Software's: Exposure to **CAESAR II** pipe stress analysis software.