Engineering Drawings, Codes, Standards and Equipment Symbols

Course general description:

All over the years the industry has accumulated its experience in standards and codes which stipulates the minimum requirements to have a safe and economic products serving to the benefit of the project stakeholders.

Every company should select from industry standards and codes and develop its standard which is its internal law responding to the minimum requirements normally set by the regulations and laws in the country where the company operates. The industry and company standards are interrelated in a way to build on the accumulated experience and mutual benefit for each party.

The course designed to provide trainees with the basic knowledge of industry standards as well as the concept of standards, codes and specifications. Explain how to read and understand the articles and language of standards and codes. At the end of this practical workshop, participants would have practical hands-on experience creating and reading engineering drawings.

Audience:

This course is designed for:

1. Operations and maintenance engineers
2. Operations engineers & supervisors
3. Procurement, planning engineers & supervisors whom their job duties require dealing with drawings
4. Supervisors and qualified senior technicians

Course objectives:

At the end of the workshop participants will be able to understand and practice the following:

- Reading the essential engineering drawings
- Be aware with different drawings development stage from conceptual design till detailed engineering stage
- Aware with equipment and piping symbols & drawings
- Aware with plans and piping arrangements
- Supports drawings and designs
- Layout and philosophy of plants arrangements

Course duration:

5 days

Course location:

Dubai

Course contents:

Day 1

- ✓ Plant Life Cycle Design
  - Provide an overview of the Plant Life Cycle
  - How to Design considering the Plant Life Cycle
  - Engineering design from concept to reality.
- ✓ Fundamental of Project management

- Project life cycle and development phases.

✓ Briefing on codes common to petroleum industries API, ASME, NFPA, BS…etc.

✓ Site and Plant layout
- Introduction
- General Site Layout
- Plant Layout
- Plant Item Layout
- Utility Plants Layout
- Safety Precautions and Considerations

Day 2

✓ Process Drawings Interpretation
- Introduction
- Block Flow Diagram
- Process Flow Diagram
- Piping & Instrumentation Diagrams
. Diagrams Structure
. Instrumentation Identification
. Instrument Symbols
. Function Symbols
. Valves Symbols
. Tag Number
. Line Identification
- Equipment Identification
. Equipment Symbols
. Tag Number
- Illustrative Example
- Case Study – Plant Overview

✓ Mechanical Drawings& Sketches Interpretation
- ISO standard paper size
- Drawing paper size
- Drawings typologies
- Assembly drawing
- Detail drawing
- Fabrication drawing
- Drawing paper size
- Machining marks and roughness
- Flange drawing
- Machine Drawing Generalities
- Information on drawing
- Drawing table
- Drawing projections
- Projection

- Third-angle projection
- Isometric
- Assembly drawings
- Screw main elements
- Helical Shape
- Threaded blind bore
- Threaded couplings
- Generalities on welded items
- Standardised indication of weldings
- Standardisation table for joint edges
- Dimensioned edge-preparation drawings
- Standardised welding indications
- Indicating welds of structural steelwork
- Screw
- Whitworth Screw
- Taper pipe and API line pipe thread

Day 3

✓ Piping
- Piping Design and Pant Lay-Out
- Pipeline System Integrity Design
- Plant piping systems drawings and symbols according to ASME B31.3
- Pipe and fittings specifications and standards

Day 4

✓ Electrical Drawings Interpretation
- Electrical Graphic Symbols
- Electrical Components Identification
- Electrical Diagrams
  . Electrical Layout Drawing
  . Cable Routing Layout
  . Plant Unit Grounding
  . Functional Diagrams
  . One-line Diagrams
  . Multi Line Diagrams
  . Wiring Diagrams
- Other Electrical Engineering Documents
- Electrical Drawing Interpretation Examples

✓ Instrumentation Drawings Update
- Structure of a drawing
- Loop diagrams and cable layout
- Hook-ups and isometrics
- P & I Diagrams

Day 5

- ✓ Material
  - Material selection and standards referenced
  - ASTM material standard specifications
  - Material quality control and certificates requirements

Methodology:

- 50% lectures & concepts
- 10% Videos
- 10% Case studies
- 10% Exercises
- 10% Discussions
- 10% Software (if applicable or examples)

Course code: (TEME016)