

Onshore Pipeline Engineering Course

Course Title: Onshore Pipeline Engineering

Duration: 3 Days

Course Description:

This comprehensive “Onshore Pipeline Engineering” course comprises of lectures, photos and video presentations, some case studies and workshops providing an overview of onshore pipelines engineering. This course provides an insight to fundamental issues for a robust, safe, and economical design of onshore pipeline systems. The topics of the course are carefully selected to cover pipeline engineering aspects from conceptual to detailed design and maintenance. The principal code followed in this course is ASME B 31.4 “Pipeline Transportation of Liquid Hydrocarbons and Other Liquids” ASME B 31.8 (Gas Transmission and Distribution Piping systems) together with other codes like BS PD 8010 – 1 (Pipeline systems. Steel pipelines on land. Code of practice), API RP 1102 (Steel Pipelines Crossing Railroads and Highways), API RP 1104 (Standard for Welding Pipeline and other related Facilities) and other relevant codes and practices.

The attendees will receive a certificate from Z-Subsea by completion of the training course.

This training course helps to gain understanding on:

- Steps involved in engineering and design of onshore pipeline systems from route selection to pre-commissioning and operation;
- Key topics related to engineering of onshore pipeline systems;
- Physical concept behind pipeline design philosophy;
- Criteria for robust and safe design of pipelines.

Who should attend:

- Pipeline engineers;
 - Pipeline Operating Professionals;
 - Project engineers and managers;
 - Engineers from other sectors of the Oil and Gas industry who wish to gain understanding of onshore pipeline engineering.
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Course Contents

1 Onshore Pipeline System Components

- Cross Country Pipeline
 - Different types of intermediate stations
 - Originating Station
 - Intermediate Booster Station
 - Sectionalising Valve Station
 - Pigging Station
- Oil Storage tankfarms

2 Field Layout and Pipeline Route Selection

- Pipeline Route Survey
- ROW/ROU and Land Acquisition
- Crop Compensation
- Government Clearances
- Geotechnical Survey
- CP Survey

3 Design Codes

- An overview of international codes
- ASME/API/BS/ISO/DNV
- Safety Considerations
- Battery Limits
- Design Format

4 Pipeline System Design

- Hydraulics and line sizing
- Liquid Pipeline Hydraulics
- Gas pipeline hydraulics
- Multiphase Pipeline hydraulics
- Pipeline Hydraulics Workshop

5 Material selection

- Cost and Safety
- Suitability for Process Conditions
- Operational Reliability
- Design for Integrity
- Optimization of Life Cycle Costs
- Mechanical Properties
- Corrosion Resistance
- Ease of Fabrication
- Coatings
- Design Life

6 Wall Thickness Design

- Safety classification
- Limit States Design
- Burst Criterion
- Allowable Stress Criterion

7 Pipeline Crossing Design

- Road Crossing (open cut/cased)
- Railways Crossing
- River/Stream Crossing

8 Pipeline Buckling Considerations

- Design against upheaval

9 Pipeline System Cost Estimation

- Pipeline Capital Cost Estimation (CAPEX)
- Pipeline Operating Cost Estimation(OPEX)
- Pipeline System Financial Analysis (IRR)

10 Cathodic Protection (CP) Design

- Methods of CP, Anode bed vs Bracelet anodes

11 Pipeline Construction

- Load-out and transportation of pipe
- Stringing
- Welding and Radiographic Examination
- Cold Field Bending
- Trenching/Blasting
- Lowering and Backfilling

12 Pre-commissioning

- Gauge plate run
- Hydrotest
- Mainline Valve Installation
- Dewatering and Drying
- Magnetic pig run and Caliper Survey
- Line Preservation

13 Pipeline Operation and Maintenance

- Optimisation of booster pumps and stations
- Optimisation of flow rates
- Enhancement of flow rate by drag reducers
- Loop lines
- Operational pigging
- Injection of corrosion inhibitors

14 Pipeline Integrity

- Overview of Integrity management, codes and standards
- Identification of pipeline, typical threats and
- Definition of pipeline integrity management
- Assessment and management of risks (quantitative and qualitative)
- Pipeline Inspection Techniques
- Pipeline monitoring techniques
- Pipeline repair techniques