Design, Installation & Maintenance of Onshore & Offshore Pipelines

# Learning Outcomes

Pipelines are the most economical ways to transport large volumes of Oil & gas over land or sea.

The course provides a brief history of the pipeline and technical background to the design of pipelines used in the transport of oil and gas.

The objective of this course is to provide the participants with the fundamentals principles behind the design, construction, Integrity Assessment and operation of both onshore and offshore pipelines.

# Course Contents

Delegates attending this course shall cover the following:

1. **Introduction to Pipeline Engineering Basic pipeline concepts and definitions**
* Introduction to the stages of a pipeline project
* Description and general requirements of standards, codes and regulations
* Introduction to the principles of pipeline design, construction and installation
* Introduction to Subsea Engineering and subsea piping
* Wall thickness calculation based on different design codes or standards
1. **Material Selection and Corrosion Control**
* Introduction to material science including the properties of steel and other materials used for pipeline fabrication
* Process of pipeline material selection, including code/standard requirements
* Manufacturing process, including welding standards, procedures and non-destructive testing (NDT) techniques for qualifications
* Introduction to corrosion, including definition of the corrosion phenomenon and chemical principles
* Types of internal and external corrosion
* Method to prevent or mitigate corrosion in pipelines
* How corrosion allowance is determined or selected
1. **Onshore & Offshore Pipeline Design**
* Introduction to different approaches of pipeline design for offshore and onshore
	+ Definition of safety and reliability factors
	+ Codes
	+ Standards
	+ Recommended practices
* Introduction to the different pipeline configurations; flexible & Composite pipelines – OCTG, Umbilicals, Flow-lines, Risers, bundles– principles and concepts
* Introduction to hydrodynamics around offshore pipelines, including the definition of the different wave theories: current and prediction of the forces acting on an offshore pipeline
* Stress assessment of pipelines, including definition of stress on pipelines and an introduction to fatigue analysis
1. **Pipeline Installation and Construction**
* Onshore Pipeline Installation
* Subsea Pipeline installation – Lay barge Construction, Reel Construction, pull & Tow
* Stages of pipeline construction
	+ Survey; Route selection
	+ Trenching
	+ Environmental and political factors
	+ Methods of onshore and offshore pipeline installation
	+ Procurement
	+ Hydro-testing
	+ Commissioning operations
	+ Quality assurance
1. **Pipeline Hydraulic Analysis**
2. **Pipeline Integrity Assessment: Maintenance, Inspection and Risk Assessment**
* Principles and applications of in-line inspection techniques and tools
* Survey methods for onshore and offshore pipelines
	+ Walking patrol
	+ Air survey
	+ Remotely Operated Vehicles (ROV)
	+ Acoustic
	+ Diver
	+ Above-ground monitoring techniques
* Pipeline Pigging Operations
* NDT techniques used to detect and evaluate pipeline defect and damage
* Integrity management plans for onshore and offshore pipelines
1. **Pipeline Operations**

**Who Should Attend**

* Mechanical, Chemical, Petroleum and Material Engineers
* Technicians, Fitters and Welders
* Draftsmen

**Materials***- (Your Take Home)*

Training Manuals, Piping Engineering &Design eBooks, Design Charts & Tables and we Guarantee Knowledge transfer.

**Duration:** Required minimum duration – **5 days Full-time.**

**Course Fee: Contact us for an invoice**

**Training Features**

* Instructor led, hands-on training.
* Assessment quiz and certificate at completion.
* Excellent Material Provided.
* Individual Attention & Placement Guidance.