

DAY 1

Pipelines Systems and Structural Integrity

- Introduction to process pipelines from source to production facility
- Types of pipes, specifications and construction
- Materials strength and relevant mechanical properties
- Pipeline structural integrity and mechanical failure, Fatigue, Creep, etc.
- Water hammer
- Worked examples of stress analysis
- Materials of construction

DAY 2

Corrosion and Corrosion Control of Pipeline Systems

- Principles of corrosion
- Kinetics of corrosion
- Forms of Corrosion
 - Uniform
 - Bimetallic
 - Pitting
 - Stress corrosion cracking
 - Erosion Corrosion
 - Microbiologically influenced corrosion (MIC)
 - Hydrogen Induced, H₂S, CO₂
- Pipeline Coatings, External, Internal
- Corrosion Inhibitors
- Cathodic Protection, Sacrificial, Impressed Current

DAY 3

Fundamental Principles of Flow Regimes and Flow Control

- Fundamental fluid Laws
- Flow profiles
- Pressure loss
- Multiphase flow

- Holdup effects
- Gas-liquid flow regimes in horizontal and vertical pipes, Flow regime maps
- Multiphase pumping systems
- Slug flow problems and damage
- Slug catchers

DAY 4

Unwanted Products in Pipelines and Methods of Control

- Pipeline clogging and blockage of pipelines
- Unwanted product types
 - Sand
 - Salinity
 - Hydrates
 - Wax
 - Asphaltenes
 - Emulsions
 - Scale
 - Corrosion and Abrasive contents
- Chemicals injected to achieve flow assurance, Hydrate Inhibitors, Drag Reducing Agents, Solvents, etc.
- Testing and separation of unwanted products

DAY 5

Pipeline Maintenance, Cleaning & Inspection and Flowrate Measurements

- Direct and indirect pipe inspection
- Pigging methods for cleaning
- Pigging Inspection
- Hydro-testing
- Inspection (NDT) techniques, x-ray, ultrasonic, Magnetic, etc.
- Overview of API 570 Pipe Inspection Code
- Flow rate measurements