



FE079: Fundamental Pipeline Design, Inspection, Testing & Hydraulic Modeling

Training Description:

This course is designed to provide participants with a detailed and up-to-date overview of Fundamental Pipeline Design, Inspection, Testing & Hydraulic Modeling. It covers the pipeline design and its importance in engineering; the types of pipelines and their applications including the basic components of a pipeline system; the fundamental principles of fluid mechanics and the different types of fluid flow; the equations used to calculate fluid flow and pressure drop in pipelines; the factors to consider when selecting pipeline materials and pipeline layout; and the importance of pipeline alignment and the types of pipeline joints.

In additionally, the course will also discuss the pipeline stress analysis and the methods used to calculate pipeline stresses; the importance of stress management in pipeline design and the factors that affect stress levels; the pipeline design standards and the organizations that develop them; the hydraulic modeling and identify the different types of hydraulic models; the pipeline sizing and the methods used to optimize pipeline design; and the factors that affect pipeline diameter and the concept of pipeline optimization.

During this interactive course, participants will learn the importance of considering environmental factors in pipeline design and optimization; the different types of pipeline inspections and pipeline testing; the importance of inspection and testing in ensuring pipeline safety and performance; the methods used to inspect and test pipelines; the pipeline maintenance, pipeline safety and pipeline repair methods; and the importance of emergency response planning and the methods used to respond to pipeline failures.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply and gain a fundamental knowledge on pipeline design, inspection, testing and hydraulic modeling
- ✓ Define pipeline design and its importance in engineering
- ✓ Identify the types of pipelines and their applications including the basic components of a pipeline system
- ✓ Discuss the fundamental principles of fluid mechanics and the different types of fluid flow
- ✓ Explain the equations used to calculate fluid flow and pressure drop in pipelines
- ✓ Recognize the factors to consider when selecting pipeline materials and pipeline layout
- ✓ Discuss the importance of pipeline alignment and the types of pipeline joints
- ✓ Carryout pipeline stress analysis and the methods used to calculate pipeline stresses
- ✓ Explain the importance of stress management in pipeline design and the factors that affect stress levels
- ✓ Review pipeline design standards and the organizations that develop them
- ✓ Illustrate hydraulic modeling and identify the different types of hydraulic models
- ✓ Apply pipeline sizing and the methods used to optimize pipeline design
- ✓ Recognize the factors that affect pipeline diameter and the concept of pipeline optimization
- ✓ Discuss the importance of considering environmental factors in pipeline design and optimization
- ✓ Identify the different types of pipeline inspections and pipeline testing and the importance of inspection and testing in ensuring pipeline safety and performance
- ✓ Carryout methods used to inspect and test pipelines
- ✓ Employ pipeline maintenance, pipeline safety and pipeline repair methods

- ✓ Discuss the importance of emergency response planning and the methods used to respond to pipeline failures

Training Designed for:

This course is intended for engineers, maintenance staff and inspectors responsible for the integrity, maintenance and repair of pipelines and piping systems. Further, the course is essential for engineers, project engineers, site/field engineers and piping/pipeline project managers.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ Introduction to Pipeline Design
- ❖ Pipeline Design & its Importance in Engineering
- ❖ Types of Pipelines & their applications
- ❖ Basic Components of a Pipeline System
- ❖ Fundamental Principles of Fluid Mechanics, such as Viscosity, Pressure & Flow Rate
- ❖ Different Types of Fluid Flow, such as Laminar & Turbulent
- ❖ Equations used to Calculate Fluid Flow & Pressure Drop in Pipelines

DAY TWO:

- ❖ Material Selection & Pipeline Layout
- ❖ Factors to Consider when Selecting Pipeline Materials, such as Strength, Corrosion Resistance & Cost
- ❖ Pipeline Layout & the Factors to Consider, such as Terrain & Obstacles
- ❖ Factors to Consider when Selecting Pipeline Materials, such as Strength, Corrosion Resistance & Cost
- ❖ Pipeline Layout & the Factors to Consider, such as Terrain & Obstacles
- ❖ Different Types of Pipeline Stresses, such as Thermal & Pressure Stresses
- ❖ Methods used to Calculate Pipeline Stresses & the Factors that Affect Stress Levels

DAY THREE:

- ❖ Pipeline Design Standards & The Organizations that Develop them, such as ASME & API
- ❖ Different Types of Design Standards, such as Safety & Performance Standards
- ❖ The Importance of Complying with Design Standards in Pipeline Design
- ❖ Hydraulic Modeling & Its Importance in Pipeline Design
- ❖ Different Types of Hydraulic Models, such as Steady-State & Transient Models
- ❖ Software used to Develop Hydraulic Models & the Input Data Required

DAY FOUR:

- ❖ Pipeline Sizing & Optimization

- ❖ Pipeline Sizing & the Factors that Affect Pipeline Diameter, such as Flow Rate & Pressure Drop
- ❖ Concept of Pipeline Optimization & the Methods used to Optimize Pipeline Design, such as Cost-Benefit Analysis
- ❖ The Importance of Considering Environmental Factors in Pipeline Design & Optimization
- ❖ Pipeline Inspection
- ❖ The Different Types of Pipeline Inspections, such as Visual, Ultrasonic & Magnetic Particle Testing
- ❖ The Importance of Inspection in Ensuring Pipeline Safety & Performance
- ❖ The Methods used to Inspect Pipelines, such as In-Line Inspection Tools & Direct Assessment Techniques

DAY FIVE:

- ❖ Pipeline Testing
- ❖ The Different Types of Pipeline Testing, such as Hydrostatic Testing & Pneumatic Testing
- ❖ The Importance of Testing in Ensuring Pipeline Safety & Performance
- ❖ The Methods Used to Test Pipelines, such as Pressure Testing & Leak Detection
- ❖ Pipeline Maintenance & Repair
- ❖ Pipeline Maintenance & the Importance of Regular Maintenance in Ensuring Pipeline Safety & Performance
- ❖ Different Types of Pipeline Repair Methods, such as Hot Tapping & Pipe Replacement
- ❖ Importance of Emergency Response Planning & the Methods used to Respond to Pipeline Failures
- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00 Morning Coffee / Tea
08:00 - 10:00 First Session
10:00 - 10:20 Recess (Coffee/Tea/Snacks)
10:20 - 12:20 Second Session
12:20 - 13:00 Recess (Prayer Break & Lunch)
13:00 - 14:00 Last Session

For training registrations or in-house enquiries, please contact:

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