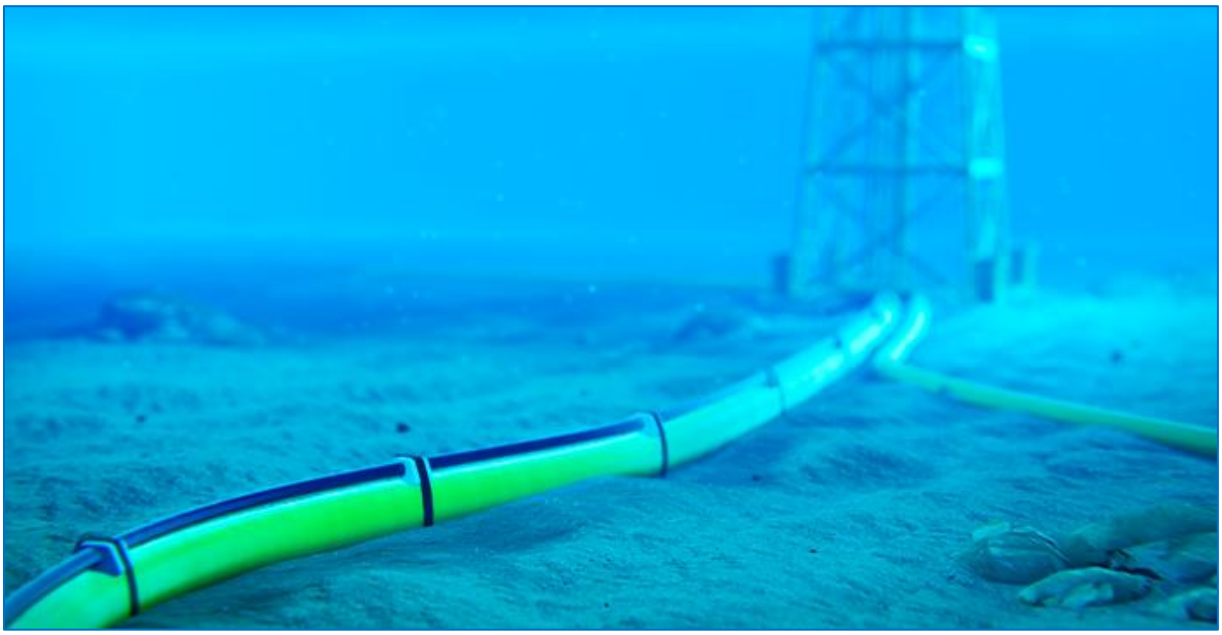
Tel No:+97126654546 |Fax No:+97126654182|Email: training@cmc-me.com|www.cmc-me.com



FE173:
Flow Assurance: Managing Flow Dynamics and Production Chemistry

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Training Description:

Flow assurance is the application of multiple disciplines to ensure economic rates of flow from the hydrocarbon reservoir to a production facility over the life of a field and in any environment. A variety of problems can be encountered to the detriment of the piping system and associated equipment.

As an example, multiphase mixtures of oil, natural gas, water and deposits are normally piped between the reservoir and the surface. In addition, the flow regime may change at different sections of the pipeline. All these issues can lead to a multitude of pipeline failures including corrosion, erosion and blockage, etc.

This intensive training course provides participants with fundamental knowledge about variety of disciplines that are required to safely and economically transport the process throughout different sections of the piping system. This is particularly beneficial for any company hoping to avoid the high maintenance and failure costs associated with process transport.

This training course will highpoint:

- Process flow regimes, influence and mitigation
- Structural integrity of piping systems
- Environmental concerns and control
- Pipeline corrosion principles, control and protection
- Influence of substance formation, hydrates, waxes, etc.
- Pipeline inspection, maintenance and cleaning

Training Objectives:

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

- ✓ Have a sound understanding of relevant flow regimes that affect the integrity of piping systems and methods of control
- ✓ Recognise the cause and influence of the formation of substances that may damage the piping system or disrupt the process flow
- ✓ Recognise various aggressive environmental factors affecting pipeline systems
- ✓ Understand the basic principles of pipeline corrosion and methods of protection
- ✓ Understand the application of relevant pipeline maintenance and cleaning techniques
- ✓ Have knowledge of process metering methods

Training Designed for:

This course is intended for Maintenance and inspection engineers, Construction engineers, Risk assessment personnel and health & safety officers, Facilities engineers and operators, Managers and supervisors, Project planners and procurement personnel and Plant contractors.

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.

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Training Program:

DAY ONE:

- 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 TWO:

- 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 THREE:

- 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 FOUR:

- 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 FIVE:

❖ 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

❖ 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.

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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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