Pipeline Operations And Maintenance

Introduction:

Pipeline systems for oil and gas industry play important role in modern industrial operations. The purpose of this course is to present basic characteristics of efficient operation of pipelines in various engineering applications.

This course will cover the interaction of pipelines with flow moving equipment, i.e. pumps and compressors and technical characteristics of operation of pump and compressor stations.

The delegates will be introduced to main points of inspection and testing according to relevant API standards.

They will also develop familiarity with methods of cleaning and other maintenance activities, including necessary repairs as prevention of failures.

The programme will include several workshops with real problems from industrial practice which will enable discussions and exchange of experiences.

The Course will feature:

- Main aspects of pipeline efficient and safe operation
- Approaches to pipeline flow control and measurements
- Processes of material degradation due to ageing and work load
- Best practices for pipeline cleaning and maintenance
- Inspection procedures and estimating remaining life of equipment

Who is this Course for?

- Process, chemical and mechanical engineers working in petrochemical and process industry, including oil refineries and gas production companies where operation and maintenance of pipelines are high importance
- Operation, technical service and maintenance professionals from various processing plants involved in everyday operation, control, inspection and maintenance of pipelines
- Engineers and consultants dealing with planning of new production lines and retrofitting plants and introducing new technologies
- Technical professionals responsible for maintenance and repair of equipment

How will this be Presented?

The course will be conducted along workshop principles with formal lectures and interactive worked examples included in several workshops. The emphasis in the course will be on the explanation of all technical phenomena and providing answers to problems that are encountered in everyday industrial practice related to installation, operation and maintenance, as well as repair and alterations of pipeline systems.

Each learning point will be reinforced with practical examples. There will be ample opportunities for active discussion and sharing professional experiences and exchange that will help solidify the gained knowledge.

What are the Goals?

By the end of this course delegates will be able to:

- Identify basic principles of safe operation & efficient maintenance of pipelines for various industrial applications.
- Develop deep understanding & familiarity with the practical aspects of operation and maintenance activities.
- Illustrate the concepts discussed and be provided with necessary experience in applying them.
- Use & follow the guidelines & best industrial practices related to operation, control, inspection & testing of pipelines.

Course Outline:

Day One

Overview of Technical Characteristics of Pipelines

- Overview of main elements of oil and gas pipeline systems
- Selection & sizing of pipelines: flow rate, MAWP, pumping power: ASME B31.3
- Selection of pipeline material and interaction with working fluid
- Operation of pump and compressor stations
- Pipeline flow control and measurements: custody transfer
- Workshop: Examples and solutions

Day Two

Operation & Material Degradation

- Pipeline material ageing: erosion, corrosion & stress corrosion cracking
- Corrosion Direct Assessment: External (ECDA) and internal (ICDA) Methods
- Cathodic protection, coating and other technologies: outer & inner surface
- Metal loss inline inspection (ILI) and smart pigging (NDT) monitoring
- Pipeline fatigue, cracks, seam defects and ruptures
- Workshop: Examples and solutions

Day Three

Operation & Safety Management

- Safety Instrumentation, Control Valves and Other Safety Accessories
- Transient operation and effects and water hammer
- Pipeline failure prevention & root cause analysis
- Leak detection methods (LDAR) and patrolling & surveillance: SCADA
- Inspection (RBI), Hydrostatic test methodology
- Workshop: Examples and Solutions

Day Four

Maintenance Technologies

- Pipeline maintenance & cleaning technologies: pipeline reconditioning
- Monitoring of pipeline vibrations and support integrity
- Repair technologies: welding of composite sleeves and segment replacements
- Maintenance of valves, fittings and accessories
- Valve repair: hot tapping, temporary plugging (stopple)
- Workshop: Examples and solutions

Day Five

Testing & Monitoring in Operation

- Hydrostatic testing: allowable operating pressure and hydrostatic test pressure
- Reliability and availability of pipelines in operation
- Risk based inspection (RBI)
- Fitness for Service (FFS)
- Estimate of remaining life of equipment
- Course summary and review