

PIPELINE OPERATIONS AND MAINTENANCE

PRD047

COURSE DESCRIPTION

Pipeline systems for oil and gas industry play important role in modern industrial operations. 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. It will cover main aspects of pipeline efficient and safe operation, approaches to pipeline flow control and measurements, processes of material degradation due to aging and work load, best practices for pipeline cleaning and maintenance, and inspection procedures and estimating remaining life of equipment. The delegates will be introduced to main points of inspection and testing according to relevant API standards. Also, they will 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 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.

COURSE GOAL

To enhance the participants' knowledge, skills, and attitudes necessary to understand and apply basic characteristics of efficient operation of pipelines in various engineering applications.

COURSE OBJECTIVES

By the end of this course, participant will be able to:

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

WHO SHOULD ATTEND

- Process, Chemical and Mechanical Engineers working in petrochemical and process industry, 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.

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Overview of Technical Characteristics of Pipelines

- Overview of main elements of oil and gas pipeline systems
- Selection and 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

2. Operation and Material Degradation

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

3. Operation and Safety Management

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

4. Maintenance Technologies

- Pipeline maintenance and 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)

5. Testing and 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

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