Strategic Pipeline Integrity: In-Line Inspection Tools and Maintenance Protocols

Energy Milestones Corporation

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Overview

This is an in-depth course on the practical aspects of piping and pipeline integrity, maintenance and repair. Participants will be introduced to the technical basis of the ASME and API integrity rules, as well as their application to case studies and exercises. The participants will be able to recognise causes of degradation in service, whether mechanically induced (pressure, vibration, fatigue, pressure transients, external damage) or due to corrosion (wall thinning, pitting, cracking), and apply integrity analysis techniques to make run-or-repair decisions. The participants will become knowledgeable in the technical basis and application of ASME B31.3, B31.4, and B31.8 piping codes, as well as ASME B31G and API 579 Fitness-for-Service and Flaw Evaluation. The participants will review inspection techniques, from the most common (PT, MT, UT, RT, MFL pigs) to the most recent (AE, PED, UT pigs and multi pigs), and the use of hydrotesting for integrity assessment and the implementation of integrity management programs, periodic inspections and evaluation of results. The course will review the various repair techniques, their advantages and shortcomings, and the logic to be followed in making repair decisions and selecting the applicable repair.

Course Objectives

At the end of this course, the participants will be able to:

- Provide a comprehensive introduction to all aspects of utility and inline inspection pigging
- Implement the standard procedure of piping and pigging during operation, maintenance and construction
- Practice in-line inspection tools with performance, theory and detection limits
- Design and implement an inline inspection using the ILI tool and a specific design
- Discuss post-in-line inspection issues and observe regulatory requirements for developing protocols and response

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Course Content

1 . Pipeline Pigging for Integrity Management

- Pigging during construction and operation
- Types: utility, cleaning, sealing, gauging, dual-diameter, magnetic cleaning pigs

2. Pipeline design for pigging, pig traps, pigging stations, tracking devices

- In-Line Inspection (ILI) Technologies
- Theory, performance, detection limits
- Metal loss detection, crack detection pigs
- Mapping, geometry/bend detection, wax deposition measurement
- Spanning pigs and semi-intelligent pigs

3. ILI Program Planning and Implementation

- Tool selection and specific design considerations
- Launch/receive trap design, bends, tees, valves
- Inquiry process and scheduling

4. Preparation for Inspection

- Controlling operational parameters during the run
- Contract development and technical specifications
- Contingency plans for stuck pigs in offshore/onshore pipelines

5. Post-Inspection Activities

- Managing post-ILI issues
- Quality assurance checks on inspection data

6. Developing Response Protocols

- Prioritising dig plans for corrosion and dents
- Meeting regulatory requirements

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Course Content

7. Validating Inspection Results

- Field NDE planning and preparation
- Comparing ILI data with actual field findings
- Establishing confidence levels

8. Fitness-for-Purpose Evaluation

- Defect assessment and repair considerations
- Incorporating results into long-term integrity and risk management programs

Targeted Audience

The course is especially designed for project managers, engineers, maintenance and technical personnel responsible for pipeline integrity assurance, flow assurance, corrosion control, and safety.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games