

Course No. 1835

Pipeline Integrity, Inspection, Maintenance and Operational Reliability in Oil & Gas

MIDSTREAM OPERATIONS, PIPELINES, STORAGE & LNG
OIL & GAS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Pipeline Integrity, Inspection, Maintenance and Operational Reliability in Oil & Gas training course provides a comprehensive and practical framework for managing the integrity, inspection, maintenance, and operational reliability of oil and gas pipeline systems. The course addresses the complete pipeline lifecycle, from design and commissioning through operation, inspection, maintenance, integrity assessment, and long-term performance management.

Participants will examine the principal threats to pipeline integrity, including internal and external corrosion, erosion, cracking, mechanical damage, geohazards, fatigue, pressure-related failures, coating deterioration, and operational abnormalities. The course emphasizes systematic approaches to identifying degradation mechanisms, evaluating pipeline condition, assessing risk, and implementing appropriate preventive and corrective measures.

The program also explores modern pipeline inspection and integrity assessment practices, including in-line inspection, non-destructive examination, corrosion monitoring, direct assessment, inspection planning, defect characterization, and remaining-life considerations. Participants will learn how to integrate inspection findings with maintenance strategies, operational controls, risk-based prioritization, and reliability objectives.

Through practical case studies, pipeline failure scenarios, inspection data analysis, maintenance planning exercises, and integrity management workshops, participants will develop the ability to make technically sound decisions that improve pipeline availability, reliability, safety, and environmental performance. The course is particularly relevant to oil and gas production, transportation, processing, refining, and petrochemical organizations operating critical pipeline infrastructure.

Objectives

- By the end of the course, participants will be able to:
- Explain the principles of pipeline integrity management across the oil and gas lifecycle.
- Identify major threats and degradation mechanisms affecting pipeline systems.
- Assess internal and external corrosion, cracking, erosion, mechanical damage, and other integrity threats.

- Develop effective inspection strategies based on pipeline condition, service, history, and risk.
- Evaluate in-line inspection and non-destructive examination techniques.
- Analyze inspection findings and determine appropriate integrity responses.
- Apply risk-based approaches to pipeline inspection, maintenance, and intervention planning.
- Develop preventive and corrective maintenance strategies for critical pipeline assets.
- Assess pipeline defects, degradation trends, and remaining service-life considerations.
- Strengthen operational controls to minimize pipeline failures and unplanned interruptions.
- Apply reliability principles and performance indicators to pipeline systems.
- Improve integrity documentation, reporting, governance, and decision-making.
- Develop integrated strategies for pipeline reliability, availability, safety, and long-term asset performance.

Who Should Attend

This course is designed for pipeline engineers, integrity engineers, inspection engineers, mechanical engineers, corrosion engineers, maintenance engineers, reliability engineers, operations engineers, and asset integrity professionals responsible for pipeline systems and related infrastructure.

It is also highly relevant to pipeline inspection specialists, maintenance and reliability managers, operations supervisors, HSE professionals, technical managers, engineering consultants, project professionals, and risk specialists involved in pipeline integrity, inspection, maintenance, and operational performance.

The program is particularly suitable for professionals working across upstream, midstream, downstream, oil and gas transportation, terminals, refineries, petrochemical facilities, and energy infrastructure where pipeline reliability and integrity are critical to safe and continuous operations.

Learning Outcomes

- Upon successful completion of the course, participants will be able to:
- Describe the key elements of an effective pipeline integrity management system.
- Identify and classify major pipeline integrity threats and failure mechanisms.

- Evaluate corrosion, cracking, erosion, mechanical damage, coating degradation, and geohazard risks.
- Develop risk-based pipeline inspection and monitoring programs.
- Interpret inspection and in-line inspection findings and identify critical defects.
- Assess pipeline condition and determine appropriate maintenance or integrity actions.
- Apply preventive, predictive, and corrective maintenance principles to pipeline assets.
- Evaluate defect growth, degradation trends, and remaining-life considerations.
- Prioritize pipeline interventions based on risk, criticality, and operational consequences.
- Strengthen operational reliability and reduce unplanned pipeline failures.
- Apply performance indicators to monitor pipeline integrity and reliability.
- Improve coordination between engineering, inspection, maintenance, operations, and HSE teams.
- Develop practical integrity improvement and reliability strategies for critical pipeline systems.

Course Outline

DAY 01

Pipeline Integrity Management Fundamentals

- Pipeline lifecycle, systems, components, and critical integrity considerations
- Principles and objectives of pipeline integrity management
- Pipeline failure mechanisms and major integrity threats
- Risk, criticality, consequence assessment, and integrity prioritization

PRACTICAL APPLICATION

Develop an integrity risk profile for a representative oil and gas pipeline

DAY 02

Pipeline Inspection, Corrosion & Defect Assessment

- Pipeline inspection planning and inspection technologies
- In-line inspection, non-destructive examination, and condition monitoring
- Internal and external corrosion, erosion, cracking, and mechanical damage

DAY 02 — CONTINUED

- Defect characterization, data interpretation, and integrity assessment

PRACTICAL APPLICATION

Analyze pipeline inspection findings and determine critical integrity threats

DAY 03

Pipeline Maintenance & Integrity Intervention

- Preventive, predictive, and corrective maintenance strategies
- Corrosion control, coating systems, cathodic protection, and monitoring
- Repair, replacement, isolation, and intervention planning
- Risk-based prioritization of maintenance and integrity activities

PRACTICAL APPLICATION

Develop a maintenance and intervention plan for a degraded pipeline section

DAY 04

Operational Reliability, Risk & Failure Prevention

- Pipeline operational controls and reliability management
- Pressure management, process conditions, operating envelopes, and abnormal conditions
- Failure prevention, incident analysis, root-cause analysis, and lessons learned
- Reliability indicators, availability, maintenance effectiveness, and performance monitoring

PRACTICAL APPLICATION

Analyze a pipeline failure scenario and develop preventive reliability measures

DAY 05

Integrated Pipeline Integrity & Reliability Strategy

- Integrating inspection, maintenance, operations, risk, and integrity management
- Long-term integrity planning and remaining-service-life considerations

DAY 05 — CONTINUED

- Governance, documentation, reporting, assurance, and management review
- Developing continuous improvement strategies for pipeline performance

FINAL WORKSHOP

Develop an integrated pipeline integrity and operational reliability program covering threat identification, inspection, risk assessment, maintenance, intervention, reliability monitoring, and long-term improvement

Register or Request More Information

Course page: <https://quest-training.com/courses/pipeline-integrity-inspection-maintenance-and-operational-reliability-in-oil-gas>

Website: <https://quest-training.com>

Email: info@quest-training.com

Phone: +905016771440