

Course No. 1836

Pipelines & Piping Inspection Training Course

**MIDSTREAM OPERATIONS, PIPELINES, STORAGE & LNG
OIL & GAS**

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Pipelines & Piping Inspection Training Course provides a comprehensive professional program for developing the knowledge and practical skills required to plan, conduct, evaluate, and manage inspection activities for pipelines and piping systems across oil & gas, petrochemical, refining, power generation, and industrial facilities. The course focuses on piping components, inspection methodologies, damage mechanisms, integrity assessment, and operational reliability.

Participants will explore practical approaches to pipeline and piping inspection, including visual inspection, thickness measurement, non-destructive testing, corrosion monitoring, defect identification, and interpretation of inspection findings. Particular emphasis is placed on connecting inspection results with operating conditions, material characteristics, degradation mechanisms, and potential failure scenarios.

The course examines major degradation and failure mechanisms affecting piping systems, including internal and external corrosion, erosion, corrosion under insulation, cracking, mechanical damage, vibration, leakage, weld-related defects, and operational deterioration. Participants will learn how to identify critical inspection locations, evaluate the significance of defects, and establish appropriate inspection priorities.

The program also connects inspection activities with maintenance, mechanical integrity, asset management, risk management, and reliability improvement. This enables participants to develop risk-informed inspection strategies, improve technical reporting, support repair and replacement decisions, and contribute to safe and reliable operation while reducing unplanned failures and production interruptions.

Objectives

- By the end of the course, participants will be able to:
- Analyze the major types, components, materials, and configurations of pipelines and piping systems.
- Apply fundamental principles for planning and managing effective piping inspection programs.
- Identify common damage mechanisms and failure modes affecting piping systems.
- Evaluate the risks associated with corrosion, erosion, cracking, mechanical damage, and

leakage.

- Apply appropriate visual inspection, thickness measurement, and non-destructive testing techniques.
- Interpret inspection findings, thickness data, and condition-monitoring information.
- Assess the impact of defects and degradation on piping integrity and operational reliability.
- Develop effective approaches for monitoring corrosion rates and piping condition.
- Prioritize inspection and maintenance activities according to asset criticality and risk.
- Evaluate requirements for repair, replacement, continued monitoring, or further assessment.
- Improve the quality, consistency, and technical value of inspection reports.
- Integrate inspection activities with maintenance, asset integrity, risk management, and reliability programs.

Who Should Attend

This course is designed for pipeline and piping inspection engineers, mechanical engineers, static equipment engineers, maintenance and reliability engineers, mechanical integrity engineers, operations engineers, inspection personnel, and technical professionals working in oil & gas, refining, petrochemical, power generation, and process industries.

It is also highly relevant to inspection supervisors, maintenance managers, asset integrity managers, reliability managers, mechanical integrity specialists, corrosion engineers, quality professionals, and personnel responsible for developing inspection and maintenance strategies.

The course is suitable for managers, technical leaders, and decision-makers responsible for pipeline integrity, asset reliability, operational safety, maintenance planning, inspection management, and decisions related to repair, replacement, and continued safe operation.

Learning Outcomes

- Upon completion of the course, participants will be able to:
- Identify the major types of pipelines and piping systems and their key components.
- Explain the relationship between piping design, materials, operating conditions, and potential damage mechanisms.

- Develop structured inspection plans based on system characteristics and risk.
- Conduct systematic visual and field inspection activities.
- Select suitable non-destructive testing techniques for specific inspection requirements.
- Analyze thickness measurement data and calculate or monitor corrosion trends.
- Identify deterioration indicators requiring additional inspection or technical intervention.
- Evaluate corrosion, erosion, cracking, weld defects, and mechanical damage.
- Interpret inspection results in relation to operating and maintenance history.
- Establish inspection priorities based on asset criticality and risk exposure.
- Develop practical recommendations for repair, replacement, monitoring, or further assessment.
- Prepare clear and technically sound piping inspection reports.
- Integrate inspection findings into maintenance, integrity, and reliability decision-making.
- Develop an integrated framework for improving piping integrity and operational reliability.

Course Outline

DAY 01

Fundamentals of Pipeline & Piping Inspection

- Types, configurations, components, and applications of pipelines and piping systems.
- Piping design fundamentals, materials of construction, and operating conditions.
- Principles of piping integrity and the role of inspection in asset protection.
- Identification of critical piping systems, components, and inspection locations.

PRACTICAL APPLICATION

Develop an initial technical profile for a piping system and identify key inspection requirements.

DAY 02

Piping Damage Mechanisms & Failure Modes

- Internal and external corrosion mechanisms and corrosion development indicators.
- Corrosion under insulation, erosion, localized corrosion, and galvanic corrosion.
- Cracking, mechanical stress, vibration, fatigue, and operational damage.

DAY 02 — CONTINUED

- Leakage, surface defects, deformation, weld defects, and fabrication-related damage.

PRACTICAL APPLICATION

Analyze piping damage cases and determine the probable damage mechanism, root cause, and operational risk.

DAY 03

Inspection Techniques & Condition Assessment

- Visual inspection techniques and identification of critical inspection points.
- Thickness measurement, thickness trending, and corrosion-rate monitoring.
- Non-destructive testing methods for detecting surface and internal defects.
- Internal pipeline inspection and condition-monitoring techniques.

PRACTICAL APPLICATION

Analyze inspection findings and thickness measurement data to identify areas requiring monitoring or intervention.

DAY 04

Inspection Data Evaluation & Risk Management

- Analysis and interpretation of inspection data and technical findings.
- Defect assessment and evaluation of impacts on piping integrity and reliability.
- Corrosion-rate assessment, remaining service life, and deterioration trends.
- Risk-based inspection principles and inspection prioritization.

PRACTICAL APPLICATION

Develop a piping risk assessment and establish an inspection plan based on asset criticality and risk level.

DAY 05

Piping Integrity & Operational Reliability Management

- Integration of inspection with maintenance, asset integrity, and reliability management.
- Development of periodic inspection programs and condition-monitoring strategies.
- Repair, replacement, rehabilitation, and follow-up of identified defects.
- Inspection documentation, technical reporting, performance indicators, and continuous improvement.
- Final Application: Develop a comprehensive piping inspection and integrity management program covering damage mechanisms, inspection techniques, data evaluation, risk assessment, intervention priorities, monitoring, maintenance, and long-term reliability improvement.

Register or Request More Information

Course page: <https://quest-training.com/courses/pipelines-piping-inspection-training-course>

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