

Course No. 1277

Corrosion Inspection & Monitoring Training Course

CORROSION, INSPECTION & NDT
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Corrosion Inspection & Monitoring Training Course provides a comprehensive and practical framework for identifying, assessing, inspecting, and monitoring corrosion across industrial equipment, infrastructure, and critical assets. The course develops the technical capabilities required to plan corrosion inspection activities, select appropriate inspection and monitoring techniques, analyze thickness measurements, determine corrosion rates, and identify deterioration trends that support engineering, maintenance, reliability, and asset integrity decisions.

Effective corrosion inspection and monitoring are essential for maintaining asset integrity, reliability, and operational continuity, particularly in equipment exposed to chemicals, process fluids, temperature variations, pressure, moisture, and demanding environmental conditions. A structured inspection program enables organizations to identify deterioration at an appropriate stage, determine areas of increased exposure, establish asset condition, and generate reliable technical information for maintenance planning and risk-based decision-making.

The course covers the principal corrosion mechanisms and their inspection requirements, including general corrosion, galvanic corrosion, pitting, crevice corrosion, erosion-corrosion, corrosion under insulation, stress corrosion cracking, hydrogen-related degradation, and microbiologically influenced corrosion. Participants will examine visual inspection, thickness measurement, non-destructive testing, corrosion coupons, corrosion probes, monitoring systems, data collection, corrosion rate calculations, trend analysis, and condition assessment.

The program also establishes a direct connection between corrosion inspection, monitoring, asset integrity, reliability, and maintenance management. Participants will learn how to develop inspection strategies based on degradation mechanisms and asset criticality, identify appropriate inspection locations, select monitoring techniques, interpret inspection results, prepare technical reports, and convert inspection data into practical maintenance and integrity actions. This approach supports more informed decisions throughout the operational lifecycle of industrial assets.

Objectives

- Analyze the fundamental principles of corrosion inspection and monitoring and relate them to common industrial degradation mechanisms throughout the course.
- Identify major corrosion mechanisms and determine potential deterioration locations to establish

appropriate inspection and monitoring requirements.

- Evaluate inspection techniques according to asset type, corrosion mechanism, operating conditions, accessibility, and asset criticality.
- Apply visual inspection, thickness measurement, and relevant non-destructive testing principles to identify and assess corrosion damage.
- Analyze thickness measurement and inspection data to determine corrosion rates and deterioration trends within the course context.
- Evaluate corrosion monitoring techniques, including corrosion coupons, probes, sensors, and continuous monitoring systems, for different industrial applications.
- Develop practical corrosion inspection and monitoring plans aligned with degradation mechanisms, asset criticality, inspection history, and risk considerations.
- Assess inspection and monitoring results to determine when corrective actions, additional inspections, or engineering and maintenance interventions are required.
- Improve the quality of corrosion inspection reports by organizing inspection data, interpreting findings, documenting condition, and prioritizing recommendations.
- Apply trend analysis and historical inspection data to support deterioration assessment, maintenance planning, and asset integrity decisions.
- Strengthen the integration of corrosion inspection results with asset integrity, reliability, maintenance, engineering, and operational programs.
- Develop a practical corrosion inspection and monitoring plan that defines inspection locations, techniques, frequencies, monitoring parameters, reporting requirements, and follow-up actions.

Who Should Attend

The Corrosion Inspection & Monitoring Training Course is designed for professionals responsible for inspecting industrial assets, monitoring their condition, and evaluating corrosion-related deterioration. It is particularly suitable for inspection engineers, corrosion engineers, asset integrity engineers, materials engineers, mechanical engineers, metallurgical engineers, reliability engineers, maintenance engineers, non-destructive testing specialists, inspection technicians, and corrosion monitoring specialists.

The course is also relevant to inspection managers, maintenance managers, asset integrity managers, reliability managers, engineering managers, technical supervisors, and professionals responsible for equipment, pipelines, storage tanks, pressure equipment, process systems, and industrial structures. It is particularly valuable for professionals involved in inspection planning,

thickness measurement analysis, corrosion rate monitoring, asset condition assessment, technical reporting, and determining requirements for additional inspection or maintenance.

Managers, asset owners, executives, and decision makers responsible for asset integrity and equipment performance can also benefit from the course. The program provides practical insight into how corrosion inspection and monitoring data can support maintenance prioritization, reliability improvement, risk management, and asset lifecycle decisions. It is also suitable for engineering, operations, and project teams involved in inspection and monitoring requirements during the design, commissioning, operation, and maintenance of industrial assets.

Learning Outcomes

- Explain the fundamental principles of corrosion inspection and monitoring and relate them to different degradation mechanisms.
- Identify common corrosion mechanisms and potential deterioration locations in equipment, pipelines, tanks, and industrial structures.
- Select appropriate corrosion inspection techniques based on asset type, degradation mechanism, operating environment, and criticality.
- Apply principles of visual inspection and thickness measurement to assess the condition of industrial assets.
- Analyze relevant non-destructive testing results used to identify and characterize corrosion damage.
- Calculate and interpret corrosion rates using thickness measurements and historical inspection data.
- Identify abnormal trends in corrosion monitoring data and determine when further assessment or intervention may be required.
- Select appropriate corrosion monitoring technologies, including corrosion coupons, probes, sensors, and continuous monitoring systems.
- Develop inspection and monitoring plans based on degradation mechanisms, asset criticality, inspection history, and risk.
- Prepare professional corrosion inspection reports containing findings, condition assessments, technical recommendations, and required actions.
- Integrate corrosion inspection and monitoring results into maintenance, reliability, and asset integrity programs.

- Develop a practical improvement plan for corrosion inspection and monitoring for a selected industrial asset.

Course Outline

DAY 01

Fundamentals of Corrosion Inspection and Degradation Mechanisms

- Principles of corrosion inspection and asset condition monitoring.
- Relationship between corrosion mechanisms, operating conditions, and inspection requirements.
- General corrosion, galvanic corrosion, pitting corrosion, and crevice corrosion.
- Erosion-corrosion, corrosion under insulation, and stress corrosion cracking.
- Microbiologically influenced corrosion and hydrogen-related degradation.
- Identification of corrosion-prone areas in equipment, pipelines, and storage systems.
- Linking degradation mechanisms to appropriate inspection locations.
- Importance of historical inspection records and previous condition data.
- Identification of critical inspection points and areas requiring enhanced monitoring.

PRACTICAL APPLICATION

Analyze an industrial asset and identify potential corrosion mechanisms and priority inspection locations.

DAY 02

Corrosion Inspection Techniques and Non-Destructive Testing

- Principles of visual corrosion inspection and surface condition assessment.
- Thickness measurement using ultrasonic testing.
- Principles of non-destructive testing for corrosion detection and characterization.
- Ultrasonic testing, radiographic testing, magnetic testing, and other applicable inspection methods.
- Inspection of surfaces, welds, components, and areas affected by corrosion.

DAY 02 — CONTINUED

- Inspection considerations for pipelines, pressure equipment, storage tanks, and industrial structures.
- Selecting inspection techniques according to corrosion mechanism, material, geometry, and accessibility.
- Capabilities, limitations, and practical considerations of different inspection techniques.
- Inspection data quality, measurement accuracy, traceability, and documentation.

PRACTICAL APPLICATION

Select appropriate inspection techniques for different industrial corrosion scenarios and evaluate the resulting findings.

DAY 03

Corrosion Monitoring and Deterioration Rate Analysis

- Principles and objectives of corrosion monitoring programs.
- Corrosion coupons and their application in evaluating corrosion behavior.
- Corrosion probes, sensors, and monitoring technologies.
- Continuous corrosion monitoring and data acquisition concepts.
- Selecting monitoring locations and critical measurement points.
- Calculating corrosion rates using thickness measurement data.
- Analyzing historical inspection results and comparing measurements over time.
- Identifying deterioration trends and abnormal changes in corrosion behavior.
- Evaluating data quality and addressing inconsistent or unreliable measurements.
- Using corrosion monitoring data to support inspection and maintenance decisions.

PRACTICAL APPLICATION

Analyze thickness measurement data and corrosion rates to identify deterioration trends and determine appropriate actions.

DAY 04

Corrosion Inspection Planning and Asset Condition Assessment

- Principles of risk-based corrosion inspection planning.
- Linking degradation mechanisms to inspection objectives, locations, and frequencies.
- Identifying critical assets and components requiring inspection priority.
- Developing inspection programs for static equipment, pipelines, tanks, and industrial structures.
- Evaluating inspection results and determining asset condition.
- Identifying requirements for additional inspection or increased monitoring frequency.
- Connecting inspection findings with corrosion rates and deterioration projections.
- Developing technical recommendations based on inspection findings.
- Documenting inspection results and preparing professional technical reports.
- Integrating corrosion inspection plans with maintenance and asset integrity programs.

PRACTICAL APPLICATION

Develop a corrosion inspection and monitoring plan for an industrial asset and establish inspection priorities and required actions.

DAY 05

Corrosion Data Management, Reporting, and Continuous Improvement

- Organizing and managing corrosion inspection and monitoring data.
- Analyzing corrosion trends and establishing relevant technical performance indicators.
- Developing professional corrosion inspection reports and converting findings into actionable recommendations.
- Analyzing recurring deterioration and identifying potential contributing factors.
- Using inspection findings to improve maintenance and reliability strategies.
- Integrating corrosion inspection and monitoring with asset integrity management.
- Establishing performance indicators for inspection and corrosion monitoring programs.
- Improving inspection strategies using historical data and asset condition information.

DAY 05 — CONTINUED

- Defining corrective and preventive actions and monitoring their implementation.
- Establishing continuous improvement practices for corrosion inspection and monitoring.
- Connecting inspection data with risk management and asset lifecycle decisions.

FINAL WORKSHOP

Develop a comprehensive corrosion inspection and monitoring program for a selected industrial asset, including degradation mechanisms, inspection locations, inspection techniques, monitoring frequencies, data analysis, reporting requirements, corrective actions, and an improvement plan.

Register or Request More Information

Course page: <https://quest-training.com/courses/corrosion-inspection-monitoring-training-course>

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