

API Inspection & Certification

Professional Training Course

Skillslab Training Provider

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Course Description

Introduction

The API Inspection & Certification course is a comprehensive professional training program designed to strengthen the technical knowledge, inspection capabilities, and code-based decision-making skills required for the integrity management of pressure vessels, piping systems, storage tanks, and other critical equipment used across the oil and gas, petrochemical, refining, energy, and process industries.

Built around widely recognized American Petroleum Institute inspection principles and industry practices, the course provides participants with a structured understanding of equipment inspection, degradation mechanisms, corrosion assessment, remaining life evaluation, inspection intervals, repair considerations, documentation, and mechanical integrity management. Particular attention is given to the practical application of API 510, API 570, API 653, API 571, and related inspection concepts commonly encountered by inspection and integrity professionals.

For organizations, effective inspection management is more than a compliance requirement. It is a strategic capability that supports asset reliability, process safety, operational continuity, risk reduction, maintenance optimization, and lifecycle cost control. This course helps organizations strengthen technical governance by developing professionals who can interpret inspection requirements, evaluate equipment condition, identify deterioration, support repair decisions, and contribute to defensible integrity management programs.

Through practical exercises, engineering examples, inspection scenarios, calculation activities, and case-based discussions, participants develop capabilities that can be applied directly within refineries, petrochemical plants, terminals, production facilities, utilities, industrial plants, and major capital assets. The program also provides valuable technical preparation for professionals seeking to strengthen their knowledge of API inspection and certification requirements.

Course Objectives

The API Inspection & Certification course aims to enable participants to:

- Understand the purpose, structure, and practical application of major API inspection requirements.
- Develop a structured understanding of API 510 pressure vessel inspection principles.
- Understand API 570 piping inspection concepts and integrity requirements.
- Explore API 653 inspection considerations for aboveground storage tanks.
- Recognize common damage mechanisms addressed within API 571.
- Understand corrosion mechanisms and their impact on equipment integrity.
- Interpret inspection data and evaluate equipment condition.
- Apply fundamental concepts of corrosion rate and remaining life calculations.
- Understand minimum required thickness and retirement thickness considerations.
- Determine inspection priorities and understand inspection interval principles.
- Improve understanding of pressure equipment, piping, and storage tank inspection practices.
- Recognize appropriate inspection and nondestructive examination techniques.
- Understand repair, alteration, rerating, and documentation considerations.
- Strengthen mechanical integrity and asset integrity management practices.
- Improve technical preparation for API inspection certification pathways.

Course Content

Day 1: API Inspection Framework and Mechanical Integrity Fundamentals

- Overview of API inspection and certification systems.
- Role of inspection within asset integrity and mechanical integrity management.
- Understanding codes, standards, recommended practices, and specifications.
- Responsibilities of inspectors, engineers, owners, operators, and maintenance teams.
- Introduction to pressure equipment and piping inspection.
- Overview of API 510 inspection concepts.
- Overview of API 570 piping inspection requirements.
- Overview of API 653 storage tank inspection principles.

- Introduction to API 571 damage mechanisms.
- Equipment lifecycle and inspection planning.
- Design, operation, inspection, maintenance, repair, and retirement considerations.
- Inspection terminology and technical documentation.
- Understanding authorized inspection activities and responsibilities.
- Importance of traceability and inspection records.
- Practical exercise on identifying applicable inspection requirements for different equipment types.

Day 2: Pressure Vessel Inspection and API 510 Principles

- Pressure vessel construction and major components.
- Understanding pressure vessel design information and documentation.
- Inspection requirements for pressure vessels in service.
- Internal, external, and on-stream inspection concepts.
- Identification of pressure vessel deterioration.
- Corrosion mechanisms affecting pressure vessels.
- General and localized metal loss.
- Thickness measurement principles.
- Corrosion rate calculations.
- Remaining life assessment.
- Minimum required thickness concepts.
- Establishing inspection intervals.
- Pressure testing considerations.
- Relief device considerations in pressure equipment integrity.
- Repair, alteration, and rerating concepts.
- Welding considerations associated with pressure vessel repairs.
- Documentation and inspection reporting requirements.
- Practical pressure vessel inspection and calculation exercises.

Day 3: Piping Inspection and API 570 Principles

- Overview of process piping systems.
- Piping components and common configurations.
- Understanding piping circuits and inspection locations.
- Classification and prioritization of piping systems.
- Common piping deterioration mechanisms.
- Corrosion under insulation.
- Internal corrosion and erosion.
- Injection points and mixing points.
- Dead legs and areas of accelerated deterioration.
- Thickness monitoring locations.
- Corrosion rate determination for piping systems.
- Remaining life calculations.
- Minimum required thickness considerations.
- Inspection frequency and interval concepts.
- External and internal inspection practices.
- Leak testing and pressure testing considerations.
- Temporary and permanent repair concepts.
- Piping alteration and rerating considerations.
- Inspection documentation and integrity records.
- Practical piping inspection case study.

Day 4: Storage Tank Inspection, Damage Mechanisms, and Examination Methods

- Introduction to aboveground storage tank integrity.
- Overview of API 653 inspection principles.
- Tank components and critical inspection areas.
- External and internal tank inspection considerations.

- Tank shell inspection.
- Tank bottom inspection.
- Roof and structural component inspection.
- Settlement and distortion considerations.
- Corrosion evaluation for storage tanks.
- Remaining thickness and integrity considerations.
- Introduction to industry damage mechanisms.
- High-temperature and low-temperature damage mechanisms.
- Wet corrosion mechanisms.
- Environmental cracking mechanisms.
- Mechanical and metallurgical deterioration.
- Overview of visual inspection techniques.
- Ultrasonic examination principles.
- Radiographic examination concepts.
- Magnetic particle examination.
- Liquid penetrant examination.
- Selection of appropriate examination methods based on expected damage.
- Practical damage mechanism identification exercises.

Day 5: Integrity Assessment, Inspection Planning, Certification Preparation, and Practical Application

- Integrating inspection findings into integrity decisions.
- Developing effective inspection plans.
- Risk-based thinking in equipment inspection.
- Inspection prioritization based on consequence and deterioration.
- Understanding risk-based inspection principles.
- Fitness-for-service awareness and its relationship to inspection findings.
- Evaluating inspection results and identifying required actions.
- Repair versus continued-service considerations.

- Inspection quality assurance and quality control.
- Managing inspection records and equipment history.
- Inspection data quality and traceability.
- Communicating inspection findings to engineering, maintenance, and management.
- Developing professional inspection reports.
- Understanding typical API certification knowledge areas.
- Approaches to technical code interpretation.
- Strategies for solving calculation-based inspection questions.
- Common challenges encountered during certification preparation.
- Integrated case study covering inspection findings, corrosion calculations, remaining life, inspection planning, and recommended actions.

Target Audience

The API Inspection & Certification course is suitable for professionals responsible for inspection, mechanical integrity, reliability, maintenance, engineering, quality, and asset management, including:

- API inspector candidates.
- Plant inspectors.
- Mechanical engineers.
- Inspection engineers.
- Asset integrity engineers.
- Mechanical integrity professionals.
- Reliability engineers.
- Maintenance engineers.
- Corrosion engineers and specialists.
- Piping engineers.
- Pressure equipment engineers.
- Storage tank inspection personnel.
- Welding inspectors.

- Quality assurance and quality control professionals.
- Nondestructive examination personnel.
- Technical supervisors.
- Maintenance and inspection planners.
- Engineering consultants.
- Professionals working in oil and gas production facilities, refineries, petrochemical plants, terminals, power facilities, utilities, and process industries.

Course Requirements

Participants should preferably have a basic technical background in mechanical engineering, inspection, maintenance, reliability, corrosion, welding, quality, operations, or related industrial disciplines.

Previous API certification is not required. However, participants with practical exposure to pressure vessels, piping systems, storage tanks, industrial inspection, or mechanical integrity activities will gain additional value from the practical applications and case discussions.

Participants intending to pursue a specific API certification should separately verify the current eligibility, experience, examination, and application requirements applicable to their selected certification program.

Training Methodology

The course applies an intensive, practical, and technically structured training methodology designed to transform inspection requirements into workplace capabilities. Rather than focusing solely on theoretical code knowledge, the program emphasizes interpretation, calculation, inspection judgment, equipment condition assessment, and real-world implementation.

The methodology includes:

- Expert-led technical presentations.
- Structured interpretation of inspection requirements.
- Practical pressure vessel, piping, and storage tank examples.
- Corrosion rate and remaining life calculation exercises.

- Equipment condition assessment scenarios.
- Damage mechanism identification exercises.
- Inspection planning activities.
- Technical discussions based on industrial cases.
- Inspection report review and interpretation.
- Problem-solving workshops.
- Individual and group exercises.
- Certification-oriented technical questions and calculation practice.
- Integrated mechanical integrity case studies.

This methodology enables participants to connect inspection requirements with actual operating conditions and understand how inspection decisions influence process safety, asset reliability, maintenance expenditure, operational continuity, and equipment lifecycle performance.

Learning Outcomes

Upon successful completion of the API Inspection & Certification course, participants will be able to:

- Explain the fundamental framework of API inspection practices and certification-related knowledge.
- Differentiate inspection requirements applicable to pressure vessels, piping systems, and storage tanks.
- Apply key inspection concepts associated with API 510, API 570, and API 653.
- Recognize significant damage mechanisms associated with process equipment.
- Interpret thickness measurement and inspection data.
- Calculate corrosion rates using inspection information.
- Estimate remaining equipment life based on applicable inspection data.
- Understand minimum thickness and inspection interval principles.
- Select appropriate inspection and examination approaches for common deterioration mechanisms.
- Evaluate equipment condition more systematically.
- Identify areas requiring additional inspection, engineering evaluation, repair, or monitoring.
- Improve inspection planning and prioritization.
- Prepare and review professional inspection documentation.

- Support mechanical integrity and asset integrity management programs.
- Communicate inspection findings effectively to engineering, maintenance, operations, and management teams.
- Approach API certification preparation with stronger technical knowledge and structured problem-solving capabilities.

Instructor Profile

The course is delivered by “An internationally certified expert with extensive practical and consulting experience.”

The instructor brings extensive professional expertise in industrial inspection, pressure equipment, piping systems, storage tanks, corrosion assessment, mechanical integrity, asset reliability, inspection planning, technical code interpretation, and professional certification preparation.

The training approach combines internationally recognized inspection principles with practical industrial experience, enabling participants to understand not only inspection requirements but also their operational implications for safety, reliability, maintenance planning, risk management, and long-term asset performance.

Contact Us

For registration inquiries, upcoming dates, or group pricing, please contact us:

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