PRESSURE VESSEL INSPECTION CODE: MAINTENANCE, INSPECTION, RATING, REPAIR

MUE151

TRAINIT ACADEMY

COURSE TITLE

PRESSURE VESSEL INSPECTION CODE: MAINTENANCE, INSPECTION, RATING, REPAIR

COURSE DATE/ VENUE

06th-10th Oct 25'

Amsterdam, Netherlands

COURSE REFERENCE

MUE151

COURSE DURATION

05 Days

DISCIPLINE

Mechanical & Utility Engineering

COURSE INTRODUCTION

This comprehensive 5-day training course provides an in-depth understanding of the principles, practices, and regulatory requirements for the inspection, maintenance, repair, and re-rating of pressure vessels in accordance with the **API 510 Pressure Vessel Inspection Code**. The course is designed to equip engineers, inspectors, and maintenance personnel with the essential knowledge to ensure pressure vessel integrity, safety, and regulatory compliance in service environments.

COURSE OBJECTIVE

Upon successful completion of this course, the delegates will be able to:

- ✓ **The scope and application of API 510 and its integration with ASME and NBIC codes.**
- ✓ **Techniques for in-service inspection, evaluation, and documentation of pressure vessels.**
- ✓ **Procedures for maintenance, repair, alteration, and rerating.**
- ✓ **Pressure testing methods and integrity assessment strategies.**

COURSE AUDIENCE

- Plant and facility engineers
- Mechanical and inspection engineers
- Quality assurance/quality control (QA/QC) professionals
- Maintenance and reliability professionals
- Authorized inspectors and those preparing for the API 510 certification exam

COURSE CONTENT

Day 1: Introduction and Overview of Pressure Vessel Codes

Objective: Build foundational understanding of pressure vessels and the regulatory framework.

- **Session 1: Introduction to Pressure Vessels**
  - **Definition and types**
  - **Common applications in industry**
  - **Risks and failure modes**
- **Session 2: Overview of Codes and Standards**
  - **API 510: Scope and purpose**
  - **ASME Section VIII, Div. 1 overview**
  - **Relationship between API 510, ASME, NBIC, and jurisdictional requirements**
- **Session 3: Responsibilities and Roles**
  - **Owner-user responsibilities**
  - **Authorized Inspector roles**
  - **Repair organization qualifications**
- **Session 4: Documentation and Records**
  - **Manufacturer's Data Reports**
  - **Inspection records and documentation**

Day 2: In-Service Inspection Practices

Objective: Learn inspection planning and non-destructive testing (NDT) techniques.

- **Session 1: Inspection Planning**
  - **Risk-based inspection (RBI) basics**

    - Internal vs. external inspection
    - Inspection frequency and intervals
- Session 2: Types of Inspections
    - Visual Inspection (VT)
    - Ultrasonic Testing (UT)
    - Radiographic Testing (RT)
    - Magnetic Particle (MT) and Liquid Penetrant (PT)
- Session 3: Corrosion Mechanisms and Damage Assessment
    - Types of corrosion and mechanical degradation
    - Fitness-for-service (FFS) evaluations (API 579 overview)
- Session 4: Inspection Report Writing and Evaluation
    - Interpreting inspection results
    - Reporting structure and requirements

Day 3: Repairs, Alterations, and Rerating

Objective: Understand acceptable repair techniques and re-rating procedures.

- Session 1: Repair Procedures
    - Temporary vs. permanent repairs
    - Welded repairs and welding procedures
    - Post-weld heat treatment (PWHT)
- Session 2: Alterations and Modifications
    - Definition and scope
    - Code requirements for alterations
- Session 3: Rerating Pressure Vessels
    - Rerating scenarios (pressure, temperature, service changes)
    - Documentation and certification requirements
- Session 4: Repair Organization Requirements
    - Qualifications
    - Use of the National Board Inspection Code (NBIC)

Day 4: Pressure Testing and Integrity Verification

Objective: Ensure knowledge of pressure testing techniques and safety precautions.

- **Session 1: Pressure Testing Overview**
  - **Hydrostatic vs. pneumatic testing**
  - **Safety precautions and test procedures**
- **Session 2: Leak Testing and Alternative Methods**
  - **Vacuum testing, bubble testing, acoustic emission**
- **Session 3: Inspection During Testing**
  - **Monitoring for deformation or cracking**
  - **Acceptance criteria**
- **Session 4: Test Records and Documentation**
  - **Recording results**
  - **Preparing test reports**

Day 5: Case Studies, Review, and Assessment

Objective: Apply learning through real-life examples and evaluate understanding.

- **Session 1: Case Studies of Pressure Vessel Failures**
  - **Analysis of real incidents**
  - **Lessons learned and preventive measures**
- **Session 2: Review of Key Concepts**
  - **Recap of API 510 requirements**
  - **Review quizzes and discussion**
- **Session 3: Final Assessment**
  - **Written test**
- **Session 4: Course Wrap-up and Q&A**
  - **Certification of completion**
  - **Open Q&A and feedback**

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

£5,500 per Delegate. This rate includes participant's manual, Hand-Outs, lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions