API 510
Pressure Vessel Inspectors

Certification Preparation Course
For Inspectors & Engineers

Applicable Sectors: Petro-Chemical & Energy.
Expertise: Beginner.
Training Setup: Class.

An API accreditation gains you the required competence and global industry confidence that inspections are conducted professionally and attest to one's competence and knowledge of the applicable industry codes, standards and recommended practices. The course is designed to develop the knowledge base of the attendees with special emphasis on exam preparation methods to aid a one-time success in Inspector examinations.

Course Structure

The Training provides participants with:

1. Knowledge of API publications and other accompanying standards. This include:
   - ≡ API 510, Pressure Vessel Inspection Code.
   - ≡ API RP 571, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry.
   - ≡ API Recommended Practice 572, Inspection of Pressure Vessels.
   - ≡ API Recommended Practice 576, Inspection of Pressure-Relieving Devices.
   - ≡ API Recommended Practice 577, Welding Inspection and Metallurgy.
   - ≡ American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, 2017 Edition I.
     - Section V, Nondestructive Examination.
     - Section VIII, Rules for Construction of Pressure Vessels, Division 1.
     - Section IX, Qualification Standard for Welding, Brazing and Fusion Procedures.
2. Maintenance, rating, inspection, repair and alteration of in-service pressure equipment.
3. Information of API Individual Certification Program and API 510 Inspector certification process.
4. Practical tests simulating the API 510 ICP exam;
5. Competence and confidence to complete the API 510 ICP qualification and recertification.

Who should attend?

The course is a five days training designed for plant personnel who are engaged in the design, inspection, maintenance and repair of process piping equipment. This course is particularly targeted for preparations of the API 510 certification examination. The structure entails the exam body of knowledge and the API510 publication effectivity sheet. Course Attendees are responsible for the documents listed as per the API ICP Effectivity Sheet. A general working knowledge of pressure equipment and their usual construction materials is a requirement to attend this course.

Plant personnel would typically include experienced:

- ≡ Unit inspectors
- ≡ Plant engineers
- ≡ Asset integrity specialists and engineers
- ≡ Operations engineers
- ≡ Maintenance engineers
- ≡ Welding engineers and allied personnel.

Certificate & Credits

Upon completion of this course, a certification of completion will be issued. This earns the attendee at the end of the course 80 professional development hours (PDHs).

Topics Covered

Day 1

- Introduction, Publications, Course Outline & Body of Knowledge
- ASME Section VIII, Division 1
- Scope and organization of the code
- Design minimum requirements and definitions
- Compensation of pressure due to static head
- Required thickness of shell and heads due to internal pressure
- Determination of joint efficiencies θ Required thickness of shell due to external pressure

Day 2

- API 510, Pressure Vessel Inspection Code θ Scope, organization and definitions based on the code
- Inspection, examination and pressure testing practices
- Determination of inspection interval / frequency and extent of inspection
- Corrosion rate and remaining life calculations
- MAWP determination.
- Introduction to Fitness for service evaluations: Repairs and alterations and Rerating.
- API 572, Inspection Practices of Pressure Vessel
- Types of pressure vessels.
- Reasons for inspection
- Inspection planning, Inspection methods and limitations
- Records and reporting

Day 3

- API RP 571, Damage Mechanisms (related to pressure vessels in general)
- ASME Section VIII, Division 1:Nozzle reinforcements and its limits , Permissible out-of-roundness, Impact testing requirements and exemptions, Heat treatment requirements , Welding requirements, Pressure test requirements, Non-destructive testing requirements, Marking and reports
- ASME Section 5: Article 1: General requirement. Article 2: Radiographic Examination. Article 6: Liquid Penetrant Examination. Article 7: Magnetic Particle Examination. Article 9: Visual Examination. Article 10: Leak Testing. Article 23, Section SE-797, Ultrasonic Standards.

Day 4

- ASME Section 9: Article 1, Welding General Requirements. Article 2: Welding Procedure Qualifications. Article 3: Welding Performance Qualifications. Article 4, Welding Data.
- API RP 576, Inspection of Pressure-relieving Devices.
- Scope, terms and definitions.
- Types of pressure-relieving devices.
- Causes of improper performance.
- Inspection / testing AND Records and reports.

DAY 5

- API RP 577, Welding Inspection and Metallurgy: Definitions, Welding inspection, processes, procedure, materials, Welder qualifications, welding Non-destructive examination, Metallurgy, Refinery and Petrochemical Plant Welding Issues. 500 example questions for practice to be reviewed during the training and open/close book exams at various stages.