



API 653: Tank Inspection, Repair,
Alteration, and Reconstruction



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Introduction:

The API 653 Above Ground Storage Tank Certification Preparation course is designed to provide individuals with a basic understanding of above ground storage tank inspection, repair, alteration, and rebuilding. This training is meant to provide a thorough overview of the engineering knowledge required for In-Service Storage Tanks, with a focus on the API.

It contains all of the code parts alluded to by the API 653 committee to the extent that they are required from an inspection standpoint. This course will define the core purposes of all codes required for study, teach participants how to read code rulings, and build confidence in their ability to make decisions.

Targeted Groups:

- Storage Tank Inspectors & Engineers
- Plant Inspectors
- Inspection & Corrosion Engineers
- Process Engineers
- Inspection Engineers for Newly constructed and reconstructed tanks
- QA/QC inspectors
- Maintenance & Mechanical Engineers
- Inspection Testing Engineers
- Fabrication Engineers

Course Objectives:

At the end of this course the participants will be able to:

- Identify the API 653 Scopes, Suitability for Service, evaluation of the tank Shell and Min. accepted thickness also the maximum allowable fill Height
- Evaluation of the tank Bottom, including settlement and release prevention Systems RPS
- Recognize the reasons for Inspection and Causes of Deterioration
- Determination of Need for Cathodic Protection and Methods of Cathodic Protection
- Employ post weld heat treatment, identify the charpy impact testing
- Carryout welding discontinuities and discuss ASME section IX WPS & WPQ and PQR

Course Content:

Unit 1: Introduction and Review of API 653 Body of Knowledge

- API 653 Scope coverage & Definitions & Suitability for Service
- Tank Shell Evaluation and Thickness Calculation for Welded Tank Shell
- Maximum Allowable Fill Height Calculation
- Tank Bottom Evaluation and release prevention Systems RPS
- Minimum Thickness for bottom and annular Plate Ring

- Tank Foundation Evaluation
- Brittle Fracture Considerations
- External & Internal Inspection and ultrasonic Thickness Inspection
- Design Considerations Reconstructed Tanks
- Tank Repair and Alteration

Unit 2: API 653 tank Dismantling and Reconstruction

- Welding s and Examination Testing requirement for the tanks
- Evaluation of Tank Bottom Settlement
- API 650 scope
- General Material Requirements
- Tank Joints Design
- Tank fabrication and welding
- Tanks Inspection, Testing, and Repairs
- Methods of Inspecting Joints

Unit 3: API 575 Scope and definitions

- Types of Storage Tanks
- Reasons for Inspection and Causes of Deterioration
- Methods of Inspection and Inspection Scheduling
- API 651 Scope and definitions
- Corrosion of Aboveground Steel Storage Tanks
- Determination of Need for Cathodic Protection and Methods of Cathodic Protection
- Design of Cathodic Protection Systems
- API 652 Scope and definitions
- Surface Preparation and Lining Application
- Recommended Inspection Parameters

Unit 4: ASME IX Welding Procedure Qualifications WPS & WPQ & PQR

- Welding Processes
- Welding Essential & non-essential and supplementary essential Variables
- P- Numbers & S-Numbers, F-number and A-number
- Welders test positions & Diameter & thickness qualification and position qualification
- Alternate F-Numbers and Alternate P-Numbers
- Damage Mechanisms Affecting Fixed Equipment in the Refining Industry API 571

Unit 5: Continue API 571 Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

- Welding Inspection and Metallurgy API 577
- Hot Tapping and In-Service Welding
- ASME Section V - Nondestructive Test Methods
- Radiographic & Liquid Penetrant & Magnetic Particle