API 653: Tank Inspection, Repair, Alteration and Reconstruction

Course Description

This Pioneers training course on API 653: Tank Inspection, Repair, Alteration and Reconstruction will focus on learning the API 653 tank inspection Code as well knowledge of the API 571, API 575, API 650, API 652, API 651, API 577, ASME Section V and ASME Section IX.

The delegates will further receive instructions on how to take the API Exam, as well as understanding of the material.

Topics include:

- Tank Shell and bottom Min. Thickness Calculation
- Maximum Allowable Fill Height Calculation
- Brittle Fracture Considerations
- Tank Joints Design, fabrication and welding
- Cathodic Protection and Methods of Cathodic Protection
- Surface Preparation and Lining Application
- Impact Test Requirements and Determination
- Development and Review of Welding Documentation

Course Objectives

The aim of this comprehensive training course is to provide the delegates with:

- Enough knowledge and skills to pass such exam and attain the API 653 certification
- 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 Methods

- This API 653 training course will be conducted along workshop principles with formal lectures, videos and interactive worked examples. Each learning point will be re-enforced with practical exercises and ample opportunities for discussion and sharing of experiences.
- The training course instructor may modify the above training methodology before or during the course for technical reasons with no prior notice to participants.
- The classroom training course of the API 653 consists of 5 days of training including the final practice exams

WHO SHOULD ATTEND?

This Pioneers training course is designed for professionals interested in getting the API-653 certification as well as:

- 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 Outline

DAY 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
- Example problems calculations

Course Outline

DAY 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
- Example problems calculations

Course Outline

DAY 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
  Example problems calculations

Course Outline

DAY4

- 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
- Example problems calculations

DAY 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 AND Visual Test examination
- Final Practice Exam