Best Technology Solutions (BTS)

Welded Tanks for Oil Storage (API 650API 653) Training program

Introduction:

The design requirements of API Standard 650 will be explained and their application demonstrated through example problems. Material, fabrication and erection requirements documentation will also be reviewed. The candidates will gain the knowledge for design of safe and economical storage tanks used in the petroleum and chemical industries. In addition to a general review of API Standard 650, an introduction to tank inspection and evaluation in conformance with API Standard 653 will be included. This course delves into the very complex world of large field erected fuel storage tanks built under API Standard 650. This is a technical design class for aboveground closed and open top welded steel storage tanks operated under atmospheric pressure reviewing: materials, design, fabrication, erection and testing.

This course will not focus on specific size tanks for typical applications. Instead, it will go through the complete design process for preparing plans and specifications for any size tank for the storage of combustible and flammable liquids. The course is not limited to the major provisions of API Standard 650. It will also review in detail the entire document including its 18 separate appendices. These other critical sections involve topics from pontoon supported roofs and low pressure tanks to some shop fabricated tanks and under bottom connections to tank on grade.

Course Objectives:

By the end of this course delegates will be able to:

- Gain an understanding of the design and maintenance requirements of aboveground atmospheric storage tanks in accordance with API-650, API-653 and API-620 respectively

Who Should Attend?

Engineers, inspectors, technologists and experienced operators with technology backgrounds who are involved in the construction, inspection, maintenance and repairs of tanks for safe operations in the plant.

Course Outline:

API Standard 650 and Related Standards

Materials

- Code materials, selection, rules
- Material requirements and the importance of material toughness, etc.

Design

- Introduction to the three methods of shell design
- One-foot method
- Variable design point method
- Elastic shell analysis method

Design Rules

- Tank shells
- Shell openings
- Flush-type fittings
- Tank roofs

Joint Design

- Roof to shell joints
- Floor joints

Checking Tanks

- Product loads and internal pressure
- Vacuum conditions
- Wind and seismic loads
- Temperature and heating operations
- Live loads and API load combinations

Fabrication and Erection

Inspection and Welding

Other Material Applications: Including Stainless Steel Tanks

Non-destructive Examination and Testing

Documentation

API Standard 650/653

- Types of tank inspections in API 653
- Tank evaluation methods
- Inspection scheduling
- Tank repairs and alterations, including NDE and testing
- Recordkeeping and documentation requirements

API Standard 620

- Design
- Design rules
- Tank shells
- Openings
- Flush-type fittings
- Tank roofs
- Joint design

- Welding
- Construction and inspection
- Examples

Calculations Section and Problem Solving

- Shell design calculations and evaluation procedures
- Tank shell evaluation
- Internal pressure evaluation
- Simple roof evaluation
- Nozzle design criteria and load envelope
- Wind load evaluation
- Seismic load evaluation
- Supported and more complex roof evaluations
- Vacuum load evaluation