

Storage Tank Design, Construction & Maintenance

Why Choose this Training Course?

Storage Tank Design, Construction & Maintenance is a course designed to offer the participants an insight into how tank farm storage tanks are designed, constructed, operated, inspected and maintained. This training course provides a comprehensive detailed overview of the American Petroleum Institute API650, API 620 and API 2610 specifications as well as the API 653 inspection standard.

Storage tanks are containers that hold flammable liquids, or compressed flammable gases for short, medium or long-term storage. Crude oil or crude product storage tank design and construction, as used in industries such as petroleum production, refinery tank farms, intermediate product storage including LPG, and product transfer operations, petrochemicals, as well as other industries consuming or producing flammable liquids, will be covered. This training course will highlight the most recent revisions and upcoming changes in the standards and will in addition include essential storage tank technology not covered by these standards.

What are the Goals?

The aim of this comprehensive training course is to provide the delegates with a sound understanding of the main features of flammable fluids' storage, in above ground storage tanks, that are available in many shapes and sizes and includes: vertical and horizontal, cylindrical; open or closed with or without floating roofs. In addition, you will learn the fundamentals of tank terminal design, construction, operation, maintenance, and inspection.

At the end of this training course participants will:

- Learn about tank design features and components

- **Understand storage tank construction methods**
- **Know the various materials of construction associated with storage tanks**
- **Grasp the relevant types of storage tanks and their associated terminology**
- **Assess storage tank performance**
- **Appreciate the governing equations associated with tank design**
- **Learn about tank safety issues**
- **Learn about tank standards and codes**
- **Appreciate failure mechanisms including corrosion**
- **Learn about methods of tank protection, including linings and cathodic protection**
- **Understand different methods of inspection**

Who is this Training Course for?

This training course is intended for tank farm and refinery employees or engineers who are required to select and or are involved in tank design, as well as anyone working in crude oil and our product storage facility. It is also intended for, but not limited to, professionals involved in handling, loading, or discharging of oil and gas cargoes.

How will this Training Course be Presented?

This training course will be conducted along with workshop principles with formal lectures, computer simulation, videos and interactive work examples. Relevant case studies will be provided to illustrate the application of each tool in an operations environment. Each learning point will be re-enforced with practical exercises and ample opportunities for discussion and sharing of experience

Course Outline

Day One: Storage Tanks Introduction

- **Review of Energy Production and Consumption**
- **Basic properties and characteristics of petroleum and products in storage**
- **Storage of flammable liquids – safety & risk**
- **Fire Fighting & Fire Protection**
- **Handling oils spills and other emergencies**
- **Introduction and uses of Storage Tanks**

Day Two: Tank Design Standards and Codes

- **API Standard 650 Design and construction of new storage tanks**
- **API Standard 620 Design and Construction of Large, Welded, Low-Pressure Storage Tanks**
- **API Standard 2610 Design, Construction, Operation, Maintenance and Inspection of Terminal & Tank Facilities**
- **Types of tanks, Bolted, Welded, etc.**
- **Tank Components, fittings and Equipment**
- **Tank Roofs, Fixed, Floating, Roof Supports etc.**
- **Tank Rim and Seals**
- **Tank Vents & Vacuum brakers**
- **Tank Drainage and water Separation**
- **Design, Sample Problem of a Heated Tank**

Day Three: Tank Selection and Design

- **Tank Selection Criteria**
- **Tank capacity & Volume Calculations**
- **Cylindrical and spherical tanks**
- **Tank Piping Systems, mixers and BS&W Control**
- **Double Wall Storage Tank**
- **Foundations construction basics**
- **Syndicate exercise – Tank Layout and Spacing**

Day Four: Tank Construction Engineering Considerations

- **Materials selection**
- **Welding and welding inspection**
- **Design Loading and Selected Tank Equations**
- **Tank Coatings**
- **Tank Manufacturing and Assembly**
- **Tank Damage**
- **Corrosion protection, Cathodic protection, etc.**

Day Five: Inspection and Maintenance

- **API Standard 653 – Tank Inspection, Repair, Alteration and Reconstruction**
- **Nondestructive inspections**
- **Tank Failure Case Studies**
- **Tank Inventory System (TIS)**
- **Level Measurement Sensors, techniques and control**
- **Course review and roundup**

Course Completion Certificate

On successful completion of the Training Course, the participants will be awarded a 5M International Consultancy & Training Company Certificate.

Training Fees details:

Number of Participants	Course Price
1 participant	KWD 1450.000
2 participants	KWD 1400.000
3 participants	KWD 1350.000
4 participants	KWD 1300.000
5 participants	KWD 1250.000
6 and above participants	KWD 1200.000