



M0047: Storage Tank Design, Construction & Maintenance

Training Description:

Storage Tank Design, Construction & Maintenance is a course designed to offer the participants an insight of how tank farm storage tanks are designed, constructed, operated, inspected and maintained. This intensive 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 aforementioned standards and will in addition include essential storage tank technology not covered by these standards.

Training Objectives:

The aim of this comprehensive training course is to provide the participants 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.

By the end of the training, participants will be able to:

- ✓ Learn about tank design features and components
- ✓ Have an understanding of 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
- ✓ Have an understanding of different methods of inspection

Training Designed for:

This 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 or product storage facility. It is also intended for, but not limited to, professionals involved in handling, loading, or discharging of oil and gas cargoes.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction
- ❖ 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 breakers
 - 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 Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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