



# CRUDE OIL TANKS: DESIGN, CONSTRUCTION, OPERATION, AND MAINTENANCE



## COURSE OVERVIEW

This intensive course provides a comprehensive understanding of crude oil storage tanks—from initial design and material selection to construction, safe operation, inspection, and maintenance. Participants will gain practical knowledge of international standards such as API 650 and API 653, construction techniques, inspection protocols, risk management, and case studies highlighting real-world failures and lessons learned. Designed for professionals in oil & gas and petrochemical sectors, the course blends theoretical principles with hands-on applications to ensure safe, efficient, and compliant tank operations.

## DATES, VENUES AND FEES



13 – 17 July 2025 - Dubai

(5 Days)

Fees

US\$ 4500

**Note:** Fee is per participant + 5% VAT (if applicable).  
Groups from the same company can enjoy a **discounted** price.

## WHO SHOULD ATTEND?

This course is appropriate for a wide range of professionals but not limited to:

- Engineers
- Operators
- Inspectors
- Maintenance Professionals

## CONTACT US NOW

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## ACCREDITATION



**This training course is certified by CPD.**

The CPD Certification Service is the leading independent CPD accreditation institution operating across industry sectors to complement the Continuing Professional Development policies of professional institutes and academic bodies. The CPD Certification Service provides support, advice, and recognised independent CPD accreditation compatible with global CPD principles. CPD is the term used to describe the learning activities professionals engage in to develop and enhance their abilities and keep skills and knowledge up to date. CPD Units are only awarded to programmes after each programme is scrutinised to ensure integrity and quality according to CPD standards and benchmarks.

## COURSE CERTIFICATE

**MSTC** certificate will be issued to all attendees completing a minimum of 80% of the total tuition hours of the course.

**CPD** internationally recognized certificate will be issued for all participants who will meet the course requirements. CPD certificates will be issued within a month of the successful completion of the course.

## TRAINING METHODOLOGY

- Expert instructor lecture, input using numerous visual aids
- Supportive comprehensive course manual enabling practical application and reinforcement
- Participant discussion and involvement regarding their specific projects and challenges
- Real-world case studies and best practices

## LEARNING OBJECTIVES

By the end of this course, participants should be able to:

- Understand the fundamentals of crude oil storage tanks
- Apply industry standards (API, ASME, ISO) in the design and operation of storage tanks
- Evaluate key design and construction parameters
- Operate and monitor crude oil tanks safely and efficiently
- Conduct tank inspections and perform integrity assessments
- Implement effective maintenance and repair strategies
- Identify and manage HSE and operational risks

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## COURSE OUTLINE

### DAY 1

#### FUNDAMENTALS OF CRUDE OIL STORAGE TANKS

##### Introduction and Tank Fundamentals

- Pre-test
- Overview of crude oil storage in upstream/midstream operations
- Types of storage tanks: Fixed roof, floating roof, domed roof, bullet tanks
- API, ASME, and ISO standards (e.g., API 650, API 653, API 620)
- Key design considerations: capacity, location, foundation, and product characteristics

##### Tank Components and Design Parameters

- Shells, roofs, bottoms, nozzles, manways, and appurtenances
- Wind girders, stairways, platforms, and secondary containment
- Design for pressure and vacuum – venting systems and pressure relief
- Tank farm layout and bund wall requirements

### DAY 2

#### DESIGN AND CONSTRUCTION PRACTICES

##### Detailed Tank Design

- Material selection and corrosion allowances
- Structural design parameters (wind load, seismic, hydrostatic pressure)
- Tank sizing and tank selection criteria
- Foundation and soil considerations (ring wall, pad, pile-supported)

##### Construction Techniques and Quality Control

- Construction sequence (bottom, shell, roof)
- Welding procedures, NDT methods (RT, UT, MPI)
- Hydrostatic testing and leak detection
- Construction safety practices and contractor management

### DAY 3

#### TANK OPERATION AND INSPECTION

##### Safe Operation and Monitoring

- Tank operation and handling crude oil (filling, discharging, sampling)
- Floating roof operation and seal systems
- Gauging and instrumentation (level, temperature, pressure sensors)
- Tank breathing and vapor control systems (degassing and venting)

##### Inspection Techniques

- API 653 in-service inspection requirements
- Routine vs. periodic inspection
- External/internal visual inspection, settlement monitoring
- Shell thickness measurement and corrosion rate analysis

### DAY 4

#### MAINTENANCE, REPAIR, AND UPGRADING

##### Maintenance Strategies

- Preventive and predictive maintenance approaches
- Tank cleaning procedures (mechanical and chemical)
- Floating roof seal replacement and rolling ladder repair
- Coating systems and cathodic protection

##### Repairs and Alterations

- Tank bottom repair and replacement
- Nozzle repairs and hot tapping
- API 653 repair limits and fitness-for-service assessment
- Upgrading tank to meet new operational needs (e.g., heating systems, insulation)

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## COURSE OUTLINE

### DAY 5

#### RISK MANAGEMENT, SAFETY, AND CASE STUDIES


##### **Safety, Risk and Environmental Management**

- HSE concerns in tank farms and operations
- Fire protection systems: foam systems, rim seal fire detection
- Overfill protection and alarms
- Environmental considerations: VOC emissions, bund management, leak detection

##### **Real-World Case Studies and Final Workshop**

- Case studies of tank failures, fires, and lessons learned
- Group exercise: Troubleshooting tank issues and recommending solutions
- Review of best practices and final Q&A
- Course recap and Post-test

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