

**Training Title**

**STORAGE TANKS: DESIGN INSPECTION & TESTING**

**Training Duration**

5 days

**Training Dates & Venue**

REF	Storage Tanks: Design Inspection &	24-28 January,	Dubai,
MO021	Testing	5 2021	UAE
		\$4,500	

Training will be held at any of the 5 star hotels. Exact venue will be informed once confirmed.

**Training Fees**

- 4,500 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

Storage Tanks find applications in different petrochemical plants, refineries, and petroleum facilities. This course is designed to cover different aspects of storage tanks, the design, construction, and methods of inspection to assure the integrity of the new constructed tanks. Tank will experience deterioration after been put in service due to different causes. To assure its integrity in service, tank need to be inspected, thickness measurements must be performed and fitness for service must be applied. To prevent and minimize the deterioration the tank must be protected against corrosion using cathodic protection systems. Safety of storage tanks is also of very essential requirements, especially for those containing hazardous type of material. Tanks must be protected from over pressurization using venting and relieving devices, and most important must be protected from fire.

The above topics will be covered in detail over five days. Discussion and participation from the delegates are encouraged to enrich the course outcomes.

**WHO SHOULD ATTEND**

Engineers, Inspectors and Technicians responsible for building, operating, maintaining, and controlling storage tanks are the most benefit from this course.

**TRAINING METHODOLOGY:**

DMCT/OL/9/18(Rev3Dt:23/9/18)

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

## COURSE OUTLINE

### DAY 1

Design and Construction

Stress and pressure terms

Tank wall thickness

Material, plates

Design parameters

Operating temperature

Design pressure

Maximum allowable stress for walls

Corrosion allowance

Lining

Procedure for designing

Tank walls

Roofs and Bottoms

Reinforcement of openings

### DAY 2

Inspection and Testing

Inspection of Materials

Measuring thickness of materials

Inspection of Welds (radiographic method)

Hydrostatic and Pneumatic tests

Proof tests for establishing allowable working pressures

Test gauges

Pressure and vacuum-relieving devices

Pressure limits

Means of venting

Liquid relief valves

Pressure setting of safety devices

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**DAY 3**

**Corrosion Protection**

**Corrosion Protection of above ground storage tanks**

**Corrosion mechanisms**

**Stray current corrosion**

**Galvanic corrosion**

**Internal corrosion**

**Cathodic Protection**

**Need for CP**

**New aboveground storage tanks**

**Existing aboveground storage tanks**

**Internal CP vs. External CP**

**Factors affecting CP**

**Methods of Cathodic Protection**

**Galvanic systems**

**Impressed current systems**

**Design of CP systems**

**Internal Cathodic protection system**

**External Cathodic protection system**

**Operation and maintenance of CP systems**

**DAY 4**

**Storage Tanks Fitness-for-Service**

**Suitability for service**

**Tank roof evaluation**

**Tank shell evaluation**

**Tank bottom evaluation**

**Tank foundation evaluation**

**Brittle fracture consideration**

**Assessment procedure**

**Inspection**

**Inspection frequency**

**External inspection**

**Internal inspection**

**Determining bottom thickness**

**Non-destructive examinations**

**Tank repair and Alteration**

**Removal and replacement of shell plate material**

**Lap-welded patch plates**

**Repair of defective welds**

**Repair of shell penetrations**

**Repair tank bottoms**

**Repair of fixed roofs**

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Repair of floating roofs  
Repair of floating roof seals

**DAY 5**

Safety and fire protection  
Fire prevention  
Vapor control  
Control of ignition sources  
Tank overfill protection  
Inspection and maintenance programs  
Fire extinguishment and control  
Controlled burn  
Extinguishing systems for tanks  
Aboveground petroleum storage tanks  
Release prevention, leak detection, and air emissions  
Tank calibration  
Coating and protection systems  
Tank alarms  
Underground storage tank  
Vapor emissions

**NOTE:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**

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