

STORAGE TANK DESIGN INSPECTION & TESTING



MSE123

COURSE TITLE**STORAGE TANK DESIGN INSPECTION & TESTING****COURSE DATE/VENUE**

8th – 12th Jun 26'

London, UK

COURSE REFERENCE

MSE123

COURSE DURATION

05 Days

DISCIPLINE

Marine & Shipping Engineering

**COURSE INTRODUCTION**

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.

COURSE OBJECTIVE

At the end of the training course, participants will:

- Learn about Tank Design Features and Components
- Have an Understanding of Storage Tank Construction Methods
- Know the Various Materials of Construction Associated with Storage Tank
- Grasp the Relevant Types of Storage Tank and their Associated Terminologies
- 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

COURSE AUDIENCE

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

COURSE CONTENT

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

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
 - 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

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

£5,500 per Delegate. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. 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.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions