Best Technology Soultions **(BTS)**

Training Program

Storage Tank Design, Construction & Maintenance Overview

Training Program

Introduction:

This course is designed to offer the participants an insight of how tank farm storage tanks are designed, constructed, operated, inspected and maintained. This course provides a comprehensive detailed overview of the American Petroleum Institute API-650, 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. The 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.

Who Should Attend?

Reliability Engineers, Maintenance Managers, Engineers & Planners, Reliability and Maintenance Engineers, Facilities and Utilities Managers, Design Engineers, Top Level Maintenance Technicians, OE Champions, Predictive and Preventive Maintenance, Technicians & Supervisors, Planners, Maintenance Supervisors, Crafts and Tradesmen, Operations Supervisors, Process Engineers, Inspectors and Inspection Supervisors, Equipment Engineers Team Leaders and Professionals in Maintenance, Engineering and Production, Maintenance managers, reliability and maintenance Engineers, Production Managers, Plant Engineers, Design Engineers, Reliability Engineers and Technicians, Operators, Safety Engineers, Risk Engineers, Safety Engineers and anyone who is involved in Reliability Engineering strategies or methodologies to include design engineers for capital projects engineers, Foreman and Technicians, Mechanical,

Electrical and Operational Personnel, Personnel designated as Planners, Key leaders from each maintenance craft, Key operations personnel, Technical professionals responsible for maintenance and repair of equipment, Professionals involved in inspection and maintenance and repair, professionals involved in asset & maintenance management auditing, Quality & Compliance Managers, Lead Auditors & Audit Team Members, Process Controllers, Maintenance Supervisors, Maintenance Planners, Predictive Maintenance Technicians & Supervisors, Materials Management Managers and Supervisors, Service Company Representatives, Asset owners & Asset Managers

Course Objectives:

By the end of this course, delegates will be able to:

- 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 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
- Learn about methods of tank protection, including linings and cathodic protection
- Have an understanding of different methods of inspection

Course Outline:

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

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

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

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.

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