CONCEPT

# Aboveground Storage Tank Inspection, Integrity and Tank Farm Operations

**Aboveground Storage Tank Inspection, Integrity and Tank Farm Operations**

## Introduction:

Aboveground storage tank inspection is where terminal losses are prevented or missed: a thinning floor, a tilting floating roof, a failed rim seal or a stuck level gauge can release product, start a fire or take a tank out of service for months. This Core Concept course equips inspectors, integrity engineers and tank farm supervisors to classify tanks, plan external and internal inspections, evaluate shell, floor and settlement findings, decide on repair, alteration and hydrotest, and run receipts, blending and overfill protection safely. Participants produce a Tank Integrity and Operating Envelope Dossier for one of their own tanks.

## Course Objectives:

- Classify fixed roof, external floating roof and internal floating roof tanks and their appurtenances by product flash point and service
- Plan external in-service and internal out-of-service tank inspections with the methods suited to shell, roof and floor condition
- Evaluate shell thickness, floor scanning and settlement survey results to decide remaining life and the next inspection date
- Determine whether a repair, alteration or reconstruction needs hydrostatic testing, following API 653 as it applies to in-service tanks
- Operate tank receipts, blending, gauging and transfers within a defined safe fill level and overfill protection arrangement
- Compile tank integrity records into a Tank Integrity and Operating Envelope Dossier for audit and turnaround planning

## Target Audience:

- Tank inspectors who carry out external and internal tank examinations and record findings
- Integrity engineers responsible for tank remaining life, inspection plans and fitness-for-service decisions
- Maintenance planners and supervisors who scope tank cleaning, repair and return-to-service work
- Tank farm operations supervisors who control receipts, transfers, blending and product movements
- Terminal HSE staff responsible for bund, fire protection and spill arrangements at tank level
- Instrument technicians who maintain level gauges, high-level alarms and independent overfill switches

## Course Outline:

### Day 1: Storage Tank Types, Components and Terminal Duty

- Fixed Roof Tanks: Cone, Dome and Umbrella Roofs for High Flash Point Products
- External Floating Roof Tanks: Pontoon and Double Deck Designs for Crude and Middle Distillates
- Internal Floating Roof Tanks for Petrol, Jet Fuel and Ethanol Vapour Retention
- Rim Seals, Roof Drains, Legs, Vents and Shell Nozzles: Appurtenance Checklist
- Tank Register Baseline: Service, Product, Capacity and Inspection History Review

### Day 2: Design Basis and In-Service Tank Standards

- API 650 and API 620 Design Basis at Overview: Shell Courses, Bottom Plates and Roof Framing
- EN 14015 and Eurocode Load Cases Compared With API 650 Practice
- API 653 Scope: Inspection, Repair, Alteration and Reconstruction of In-Service Tanks
- API STD 2610 Terminal and Tank Facility Design and Operation at Overview
- EEMUA 183:2011 Guidance on Tank Bottom and Floor Integrity

### Day 3: Tank Inspection Planning and Methods

- External In-Service Inspection Route: Shell, Roof, Foundation Ring and Appurtenances
- Internal Out-of-Service Inspection: Gas-Free Entry, Cleaning Scope and Visual Survey
- Ultrasonic Shell Thickness Grid and Corrosion Rate Calculation by Course
- Magnetic Flux Leakage Floor Scanning With Ultrasonic Prove-Up of Indications
- Drone and Remote Visual Inspection of Roofs, Wind Girders and Seals

### Day 4: Damage Evaluation, Repair, Hydrotest and Overfill Risk

- Uniform Settlement, Planar Tilt and Differential Settlement Survey Evaluation
- Floor Underside Corrosion, Annular Plate Loss and Chime Area Leak Paths
- Repair and Alteration Decisions: Shell Patches, Door Sheets, Nozzle Additions and Floor Replacement
- Hydrostatic Test Decision, Fill Plan and Settlement Monitoring During Test
- Overfill Prevention per API Recommended Practice 2350 and BS EN 61511 Safety Instrumented Level Trips

### Day 5: Tank Farm Walkthrough and Integrity Dossier Build

- Guided Tank Farm Walkthrough: Bund Walls, Drain Valves and Firefighting Foam Connections
- Rim Seal Fire and Full Surface Fire Scenario Review With Cooling Water and Foam Pourers
- Receipt, Blending and Gauging Log Audit Against Safe Fill Levels and Vapour Control Measures
- Buncefield Overfill Case Analysis: Stuck Level Gauge and Inoperative High-Level Switch
- Tank Integrity and Operating Envelope Dossier Build and Peer Review

## Skills You Will Gain:

- Tank Appurtenance Assessment
- Inspection Interval Planning
- Shell Thickness Evaluation
- Floor Scan Interpretation
- Settlement Analysis
- Hydrotest Decision Making
- Overfill Protection Verification
- Tank Integrity Recordkeeping

## Why Attend This Course:

- Return with a Tank Integrity and Operating Envelope Dossier prepared for a tank at your own terminal
- Justify inspection intervals and out-of-service dates to management with thickness, floor and settlement evidence
- Catch overfill, seal and bund weaknesses on the tank farm before they become a release or a fire
- Compare tank inspection and tank farm practice with peers from crude, refined product, chemical and water storage sites

## Conclusion:

Safe tank storage depends on knowing each tank's construction, inspecting it with the right methods at the right intervals and running it inside a defined operating envelope. The course moves from tank types, roofs and seals, through design and in-service standards, to external and internal inspection, thickness and floor data, settlement, repair and hydrotest decisions, and overfill protection. The final day applies this in a tank farm walkthrough and produces a Tank Integrity and Operating Envelope Dossier ready for the next inspection and turnaround plan.