API 653: Tank Inspection, Repair, Alteration and Reconstruction Training Course

Professional Development Training Course Outline

Category	Engineering	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

API 653: Tank Inspection, Repair, Alteration and Reconstruction Training Course is designed to equip professionals with the advanced knowledge and skills required to inspect, maintain, and ensure the integrity of aboveground storage tanks (ASTs). The course delves into the critical standards set by the American Petroleum Institute (API), preparing participants for the rigorous **API 653 exam**. It provides a comprehensive understanding of the entire lifecycle of storage tanks, from initial construction and in-service inspection to complex repair, alteration, and reconstruction procedures. By mastering this standard, participants will be able to perform accurate fitness-for-service evaluations, conduct precise non-destructive testing (NDT), and implement effective corrosion prevention and remediation strategies, thereby ensuring asset reliability and regulatory compliance.

Our program goes beyond mere theory, offering a practical, application-oriented approach to **tank inspection**. We focus on real-world scenarios and hands-on calculations to solidify your understanding of crucial concepts like brittle fracture, cathodic protection, and shell thickness evaluation. The course content is strategically structured to align with the **API 653 Body of Knowledge**, incorporating essential reference documents such as API 650, ASME Section V, and ASME Section IX. This holistic training ensures you're not only prepared to pass the certification exam but also to excel as a competent and **certified API tank inspector** in the demanding fields of oil and gas, petrochemicals, and energy.

Programme Curriculum

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Course Duration

5 days

Course Objectives

Upon completion of this course, participants will be able to:

1. **Interpret and apply** the API 653 standard for **aboveground storage tank inspection**.
2. Master the principles of **tank integrity assessment** and fitness-for-service evaluations.
3. Perform **API 653 calculations** for shell thickness, remaining life, and corrosion rates.
4. Understand and apply various **non-destructive testing (NDT)** methods for tanks.
5. Formulate and evaluate comprehensive **tank repair and alteration** plans.
6. Analyze **damage mechanisms** affecting ASTs using API 571.
7. Assess and mitigate risks related to **tank brittle fracture** and settlement.
8. Design and evaluate **cathodic protection** systems for tank bottoms (API 651).
9. Review and interpret welding procedure specifications (WPS) and welder qualifications (ASME Section IX).
10. Determine appropriate **inspection intervals** and scope based on risk.
11. Effectively manage and document **tank reconstruction** and relocation projects.
12. Ensure **regulatory compliance** and best practices in all inspection activities.
13. Pass the **API 653 certification exam** with confidence.

Organizational Benefits

- Ensures storage tanks meet stringent industry and regulatory safety standards, significantly reducing the risk of failures, leaks, and environmental incidents.
- Improves the reliability and longevity of critical assets, minimizing downtime and optimizing maintenance schedules through effective inspection and repair strategies.
- Proactive identification and management of potential tank failures, leading to reduced operational risks and associated costs.
- Proper inspection and maintenance extend the service life of aboveground storage tanks, preserving asset value and avoiding costly replacements.
- Invests in the professional growth of employees, creating a highly skilled workforce capable of handling complex inspection and integrity challenges.

- Certified staff demonstrates a commitment to quality and safety, enhancing the organization's reputation and giving it a competitive edge in the market.

Target Audience

1. Mechanical & Inspection Engineers
2. Tank Inspectors: Individuals seeking to obtain or renew their API 653 certification.
3. Maintenance & Operations Supervisors.
4. Corrosion Engineers.
5. Quality Assurance/Quality Control (QA/QC) Personnel.
6. Erection and Fabrication Engineers.
7. Facility Integrity Managers.
8. Engineering Consultants.

Course Outline

Module 1: Introduction to API 653 & Tank Integrity Assessment

- Understanding the Scope.
- Fundamentals of Tank Design.
- Damage Mechanisms.
- Inspection Planning.
- **Case Study:** A leaking tank bottom is discovered during an in-service inspection. Participants will analyze the initial inspection data, determine the corrosion rate, and calculate the remaining life of the tank bottom using API 653 guidelines.

Module 2: Calculations and Evaluations

- Shell Thickness Calculations.
- Tank Bottom Evaluation:
- Brittle Fracture Assessment.
- Foundation and Settlement Analysis.
- **Case Study:** A tank is being re-rated for a higher fluid level. Participants will calculate the new required shell thickness for each course, ensuring the tank can safely handle the increased hydrostatic pressure according to API 653.

Module 3: Non-Destructive Testing (NDT) & Welding Inspection

- NDT Methods.
- Welding Fundamentals.
- Welding Procedure Qualification.
- Weld Flaws & Discontinuities.
- **Case Study:** A repair patch is to be welded onto a tank shell. Participants will review the proposed WPS, check for essential variables, and ensure the welder's qualifications are valid for the repair work, as per ASME Section IX.

Module 4: Repair, Alteration, and Reconstruction

- Repair Procedures.
- Alteration & Reconstruction.
- Hot Tapping & In-Service Welding.
- Post-Weld Heat Treatment (PWHT).

- **Case Study:** An internal corrosion scan identifies a localized pit that exceeds the minimum thickness. Participants will develop a repair plan, specifying the patch size, material, and required NDT to be performed after the repair is completed.

Module 5: Cathodic Protection & Coatings

- Corrosion Prevention.
- Cathodic Protection (CP).
- Tank Linings & Coatings.
- Inspection Techniques for CP & Linings.
- **Case Study:** A tank's cathodic protection system is not meeting the required criteria. Participants will analyze the rectifier readings and anode bed performance, propose corrective actions, and document the inspection findings.

Module 6: Re-Rating & Remaining Life

- Re-rating Calculations.
- Fitness-for-Service.
- Remaining Life Assessment.
- Documentation.
- **Case Study:** An inspector discovers shell pitting during an external inspection. Participants will measure the pit depth, calculate the remaining wall thickness, determine the corrosion rate, and calculate the remaining life of the tank, then recommend a future inspection interval.

Module 7: API 571 & 577 Overview

- API 571.
- API 577.
- Practical Application.
- Review of Key Concepts.
- **Case Study:** A tank shell shows evidence of chloride stress corrosion cracking. Using principles from API 571, participants will identify the cause, assess the severity, and recommend mitigation strategies.

Module 8: Exam Preparation & Practical Application

- API Exam Format: Understanding the structure of the API 653 exam, including open-book and closed-book sections.
- Study Strategies: Developing effective study techniques and time management skills for the exam.
- Mock Exams: Taking a series of practice exams to simulate the real test environment and identify areas for improvement.
- Formula Review: A dedicated session to review and apply all key formulas and calculations.
- Final Q&A: An open forum for participants to ask questions and clarify any remaining doubts.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.

- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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