



N609: API 650, 653, and 620 Storage Tanks

Tutor(s): Jack Mooney / Philip Myers

2 Days

Competence Level:
Basic Application



Classroom Course

Summary

This course is designed for petroleum or other industry personnel responsible for the design, construction, inspection, maintenance, regulatory compliance, or operation of API above ground storage tanks. It will provide a comprehensive overview of the relevant standards for new construction and existing tank inspection, repair, alteration and maintenance, highlighting the most recent revisions and upcoming changes. Essential storage tank technology not covered by the standards will also be reviewed. Please note a copy of the standards is not included.

Learning Outcomes

Participants will learn to:

1. Understand the important requirements of API 650, API 653, and API 620, including their addenda and annexes.
2. Apply the terminology of storage tanks.
3. Discuss the materials used to construct and maintain storage tanks.
4. Analyze the design limits of storage tanks.
5. Demonstrate the requirements, timing, and frequency of storage tank inspection.
6. Demonstrate tank repair materials and methods.
7. Review publications applicable to tanks, including API standards.
8. Understand important storage tank requirements not included in the API standards.

Duration and Training Method

This is a two-day classroom course comprising lectures illustrated with numerous examples and exercises. A variety of forms associated with the API standards are presented. Participants will earn 1.6 CEUs (Continuing Education Credits) or 16 PDHs (Professional Development Hours).

Who Should Attend

Anyone involved with design, operations, maintenance and management of storage tanks. It should be noted that failure to follow national tank standards, such as those covered, carries the risk of liability should there be a failure or injury.

Prerequisites and Linking Courses

There are no prerequisites for this course.

Related courses on oil and gas field surface facilities include N611 (Introduction to Crude Oil Gathering and Processing), N612 (Introduction to Natural Gas Gathering and Processing) and N613 (Natural Gas Processing - Dehydration, Refrigeration, and Fractionation).



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Course Content

Topics Covered

- Atmospheric Tanks
- Tank Site, Foundation Design and Construction
- Preventing Bottom Leaks, Tank Settlement
- Materials - Carbon Steel, Aluminum, Stainless
- Design, Sample Problems, Heated Tanks
- External/Internal Pressure, Seismic, Other Loads
- Nozzles and Roof Types
- Fabrication (Shop Work)
- Erection, Welding Requirements
- Testing and Tolerances
- Inspection, Radiography, Ultrasonic
- Welding Requirements
- Marking, API Monogram
- Documentation, Special Service Standards
- Existing Tank Evaluation, Inspection, Repair, Alteration and Reconstruction
- Failures Leading to these Requirements
- Organizations that May Use the Standard
- Definitions of Authorized Inspector, Storage Tank Engineer
- Evaluation to Determine Suitability for Continued Use
- How to Evaluate and Keep Bottoms Leak Free
- Brittle Fracture Considerations
- Inspection and Required Frequency
- Repair and Alteration Requirements
- Internal Inspection Timing Optimization
- Low Pressure Storage Tanks
- Refrigerated and Cryogenic (Such as LNG) Tanks
- Smaller tanks such as oilfield production tanks and UL tanks

Day One

API Standard 650 for design and construction of new storage tanks. Even if you only deal with existing tanks, you must be familiar with API 650 for installing items in existing tanks, such as new nozzles, and requirements not included in the standards for existing tanks. Also presented are tank type selection for various products, insulation for heated tanks, when to use shop fabricated tanks and other items not covered in API 650 but essential for anyone working with tanks.

Day Two

API Standard 653 for tank inspection, repair, alteration and reconstruction. An exercise will be conducted to optimize selection of tanks for internal inspection. The required inspection frequency and what to inspect will be covered in detail. How to avoid problems and failures when modifying or repairing old tanks which do not meet current standards. A small amount of time will be devoted to API Standard 620,



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which deals with low pressure storage tanks, such as tanks with blanketing gas and refrigerated products (butane, propane, LNG, etc.), and smaller tanks such as oilfield production tanks and Underwriters Laboratory tanks.