

# **Storage Tank Design, Construction and Maintenance**

## **Introduction**

The success of every company depends of each employee's understanding of the key business components. Employee training and development will unlock the companies' profitability and reliability. When people, processes and technology work together as a team developing practical solutions, companies can maximize profitability and assets in a sustainable manner. Training and development is an investment in future success - give yourself and your employees the keys to success

It is strategically important that your maintenance team understands the fundamentals of process tank design and operations concepts. This is the difference between being in the best quartile of operational ability and being in the last quartile. There is vast difference in the operational ability of operating companies and most benchmarking studies have confirmed this gap in operational abilities.

Whether you have a team of new or seasoned employees, an introduction or review of these concepts is very beneficial in closing the gap if you are not in the best quartile, or maintaining a leadership position. Most studies show that a continuous reinforcement of best practices in operational principles is the most effective way to obtain the desired results. Training and learning should be an on going continuous life long goal.

## **Course Objective**

This course will guide the participates to develop key concepts and techniques to operate repair and troubleshoot Storage Tank Systems. These key concepts can be utilized to make decisions that can improve your unit's performance.

This course will help;

1. Provide an appreciation of the fundamentals design requirements for new storage tanks
2. Understand the various techniques available for safe site build and achieving quality assured standard for the construction of storage tanks
3. Consider maintenance strategies for the inspection, assessment repair and maintenance of storage tanks.

The purpose of this seminar is to improve and update the participant's personal knowledge of Storage Tank Systems and will include:

#### Outline

- Introduction and Course Objectives
- Review of International Construction code Requirements
- Foundation and Tank Floor Design
- Tank Shell Design
- Wind Girder Requirements
- Tank Roof Design
- Frangible Roof
- Tank Erection Methods
- Tank Jacking
- Inspection of Storage Tanks
- Non Destructive Testing of Storage Tanks
- Tanks Floor Inspection
- Tank Floor Repair and Repair and Replacement
- Tank Shell Repair and Replacement
- Tank Roof Repairs
- Floating Roof Repairs

#### **What You Can Expect To Gain;**

- Overview of the Storage Tank System
- Design Evaluation Techniques
- An understanding of tank / and stored product interaction
- An understanding of essential tanking concepts
- Valuable practical insights for trouble free design and field proven techniques for commissioning, start up and shutdown of storage system operations
- To tailor your approach to specific design, analysis and trouble shooting problems.

## Course Syllabus

This suggested course is three to four days. The goal of the course would be to refresh the knowledge of those who have a basic understanding of process operations and to build a foundation to those who are new to process operations.

### Day One

#### Introduction

1. Introduction to the Process Industry
2. Safety for the Process Industry

#### Storage Systems

3. Introduction to Storage Systems
4. History of Storage Systems
5. Review of Tanks Codes

### Day Two

#### 6. Fixed Roof Tanks

- A. Basic Design
  1. Leak Prevention
  2. Leak Detection
  3. Secondary Containment
- B. Construction
- C. Maintenance

#### 7. Floating Roof Tanks

- A. Basic Design
  1. Leak Prevention
  2. Leak Detection
  3. Secondary Containment
- B. Tanks Seals
- C. Construction
- D. Maintenance

8. Tank Corrosion Mitigation

- A. Causes of Corrosion
- B. Tank Floor Corrosion
- C. Lining Systems
- D. Sulphur Corrosion

Day Three

- 9. Inspection
  - A. Non Destructive Testing
- 10. Sludge Control Guidelines
- 11. Storage Tank Maintenance Guidelines
  - A. Planning
  - B. Inspection
  - C. Managing

Day Four

- 12. Tank Repair Guidelines
- 13. Storage Tank Safety
  - A. Fire Fighting Guidelines
  - B. Preparing for Personnel Entry
- 14. Auxiliary Equipment
  - A. Pumps
  - B. Control Valves
  - C. Heaters / Heat Exchangers
- 15. Summary

### **Who Should Attend:**

- People who are making day to day decisions regarding operation, design, maintenance and economics of processing plants;
  1. 1<sup>st</sup> Line Operations personnel,
  2. Operation Supervisors,
  3. 1<sup>st</sup> Line Maintenance personnel,
  4. Maintenance Supervisors,
  5. Senior Plant Supervisors,
  6. Operations Engineers
  7. Process Support Engineers,
  8. Design Engineers,
  9. Cost Engineers.
  
- Ideal for veterans and those with only a few years of experience who want to review or broaden their understanding in Processing Plant Operations.

Other professionals who desire a better understanding of subject