

**Training Title**

**API 510: PRESSURE VESSEL INSPECTION CODE**

**Training Duration**

5 days

**Training Dates & Venue**

REF WC052	API 510: Pressure Vessel Inspection Code	5	25-29 October 2020	\$4,500	Dubai, UAE
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Training will be held at any of the 5 star hotels. Exact venue will be informed later.

**Training Fees**

- 4,500 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING INTRODUCTION**

Complexity of chemical and petroleum processing is more these days than it was 50 years ago. Continuous variation in product input and demands for high quality and productivity make operational and maintenance staff to stand on edges all the time.

With more pressure to increase the productivity, plants staff are likely to exceed design parameters occasionally or unknowingly.

In older plants deterioration sets in which is not visible to human eye; and with inbuilt flaws and defects from design stage, failure are likely to occur unexpectedly in some parts of plant and machinery.

Codes and Standards were developed only from failures and lack of understanding of material capability and they are written for our benefit that we don't do the same mistakes. Fabricational and assembly short comings also occur due to operation urgencies .

Therefore plant reliability and asset management is a joint responsibility of all concerned. This course gives an overview of testing and knowing strength and weakness of all plant components and act accordingly.

**TRAINING OBJECTIVES**

To create an awareness of:

- The importance of codes and standards for plant safety and reliability
- The body of knowledge to all operational and maintenance personal who are more concerned with productivity than safety and reliability.

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- Material selection skills to all who are responsible for all repair and alteration and contractor dependent works

### WHO SHOULD ATTEND?

This course is useful for fresh & experienced engineers or engineers desiring to shift to process equipment and pressure vessel engineering disciplines. It will be suitable also for individuals who work in process operation, process control, maintenance and repair, inspection and other activities related to pressure vessels.

### TRAINING METHODOLOGY

A highly interactive combination of lecture and discussion sessions will be managed to maximize the amount and quality of information, knowledge and experience transfer. The sessions will start by raising the most relevant questions, and motivate everybody finding the right answers. The attendants will also be encouraged to raise more of their own questions and to share developing the right answers using their own analysis and experience.

All attendees receive a course manual as a reference.

This interactive training workshop includes the following training methodologies

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

### COURSE OUTLINE

#### Day 1

#### Pressure vessel design ASME VIII DN.1

- Introduction
- Importance of codes and standards
- The 5 importance section of studies in ASME and 5 important section in API standards
- Definition:
- Design concepts and engineering
- selection of material
- allowance of stress,  
  
internal pressures,  
○ thickness of shell.
- Unstayed flat heads

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external pressure

- thickness of shells and tubes,
- cylinder under external pressure.

## Day 2

Pressure vessel Design-contd.

Pressure testing

- Design temperature
- Loading
- Corrosion
- Maximum allowable working pressure

Hydrostatic test and procedure

- Pneumatic test and procedure
- Exercises

## Day 3

welding ASME VIII 1 Sec.3

- Introduction
- Definitions
- Types and joint categories
- Allowable stress and efficiencies
- Joint efficiencies
- Procedure qualifications
- Performance qualifications
- WPS
- PQR
- Minimum requirement for weld at openings
- Reinforcement for opening in shells and heads
- Limits of reinforcement
- Requirement for strength of reinforcement
- Reinforcement of multiple openings
- How properties of Cs and SS affected by welding
- PWHT

## DAY 4

ASME V art 2 NDE and testing

Testing of weld

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- Mechanical and other testing (RT and UT)
- Charpy impact test requirements
- Material identification
- Inspection of materials
- NDE methods RT, UT.

### Day 5

#### Related API standards

#### API 510 chapter II Corrosion rate and inspection intervals

- Corrosion and its causes
- Corrosive elements in products and operation
- Eight types of corrosion
- Environment and factors
- long and short term corrosion rate
- Remaining life calculation corrosion and minimum thickness evaluation
- MAWP determination
- Quiz

#### API 572 sec.6-9 Inspection of pressure vessels

- scope
- Reason for inspection
- Causes of deterioration
- Methods of inspection
- Inspection records and reports
- Maintenance inspections
- QUIZ

#### API 576 Inspection of pressure relieving devices

- Scope
- Safety and relief valves
- Balanced and pilot operated
- Pressure and or vacuum vent valves
- Rupture discs

#### API 579 Fitness for service

- introduction

NOTE:

Pre & Post Tests will be conducted

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Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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