



Best Technology Solutions (BTS)

## Pressure Vessels ASME and API Codes Training program

### Introduction:

This course provides an overview of code organization, editions and addenda. The candidates will learn how to prepare and submit an inquiry to the Code Committee for Code Interpretation, Code Cases or Code revision. It is suggested (but not required) that you bring the latest Edition of the ASME Code Section VIII, Division 1, and Pressure Vessels. This course is a comprehensive introduction to the requirements of various codes and standards, regarding inspection, repairs and alterations of pressure equipment, and in particular pressure vessels. The requirements of the National Board Inspection Code and the API-510 will be covered in detail. A brief introduction to API-579, Fitness for Service will also be included. Simple flaw evaluation procedures will be evaluated. The activities of ASME's Post Construction Committee will be explained and documents published by this Committee will be discussed.

Based on the rules for pressure vessel design and construction, this course is a comprehensive introduction to the requirements of Section VIII, Division 1 including background, organization, design, materials, fabrication, inspection, testing and documentation of pressure vessels. The more commonly used subsections and paragraphs will be covered, and a discussion of individual problems or situations will be included. This course is intended for beginners, as well as experienced vessel designers who would like to update their knowledge of the Code.



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## Who Should Attend?

Engineers, technicians and personnel involved with the purchase, design, fabrication, or inspection of pressure vessels, anyone from users, manufacturers, repair organizations, inspection agencies and other organizations involved with maintenance and repair of pressure equipment. This course is intended for beginners, as well as experienced personnel wishing to update their knowledge

## Course Objectives:

**By the end of this course delegates will learn about:**

- Understand the background of the Code rules
- Apply the Code rules to more common design and fabrication situations
- Perform calculations for some of the loadings and situations not addresses by the Code
- Prepare design specifications, design reports, Data Reports, and other documentation
- Learn about the latest developments in the rapidly advancing field of pressure equipment inspection and repairs
- Receive an overview of the work being performed by API, ASME, and PVRC, in the related areas



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## Course Outline:

### Module I: Design & Fabrication of Pressure Vessels

- Code rules, scope and jurisdiction
- General requirements related to materials and testing
- Material toughness and impact testing requirements
- Joint categories and joint efficiencies
- Welding requirements
- Committees, operation and voting procedures
- Editions, addenda and interpretations
- Design Requirements
- Design loadings and allowable stresses
- Design criteria and strength theory for Division 1
- Formulas for internal pressure and tensile loading
- Openings and reinforcement
- Hydrostatic and pneumatic testing
- Background of the design rules
- Example design problems and solutions
- Cylindrical shells and formed heads
- Seismic loading on vertical vessels



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- Nozzle reinforcements
- Other special components
- External pressure and stiffening rings
- Reinforced openings and ligament efficiency
- Open discussion of design problems
- Procedures for external pressure (vacuum) and compressive loads
- General requirements related to stamping, reports, testing, PWHT, tolerances, and NDEs

## Module II: Inspection, Repairs, & Alterations of Pressure Vessels

- Introduction to post construction codes
- Standards and the interrelation of various documents
- Explanation of the responsibilities of the users, manufacturers, repair organizations, regulatory agencies and authorized inspectors
- How to obtain National Board stamp
- Detailed requirements of the NBIC
- Differences between the NBIC and API-510
- Examples of repairs and alterations and the documentation requirements for each





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- An introduction to API-579
- Evaluation of corroded areas
- Evaluation of pitted areas
- Evaluation of misalignments and other geometric flaws
- Simple Level 1 evaluation procedures for other flaws
- An introduction to the ASME post Construction Committee
- Overview of work being performed by API, ASME and PVRC
- Examples demonstrating the application of the rules
- Open discussion of specific situations and problems brought up by the attendees