Best Technology Solutions (BTS)

Materials, Fabrication, Inspection & Testing Requirements for Pressure Vessels Training program

Introduction:

Based on the ASME Code Section VIII, pressure vessels are containers for the containment of pressure, either internal or external. This pressure may be obtained from an external source, or by the application of heat from a direct or indirect source, or any combination thereof. Based on the rules for pressure vessel design and construction, you will gain 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.

Who Should Attend?

Inspectors, engineers, maintenance and QA personnel who work for owner-user companies, inspection companies, fabricators, maintenance service and repair companies, inspection companies, EPC's and others who want an understanding of the principals and applications of ASME VIII Division

Course Objectives:

By the end of this course delegates will learn about:

Gain the basic understanding of the fabrication, inspection and testing portions of ASME Section VIII Division. Principals of design will also be discussed, but not in sufficient detail that this course can be considered sufficient as a design course for new construction. ASME VIII Division 1 deals only with new construction, but in this course the application of the principles expressed in the Code will be extrapolated to deal with operation and maintenance issues and how they work with API 510 for post construction inspection, repairs and alterations. The course also includes a brief introduction to ASME Section II Part A (ferrous material standards) and to ASME Section IX Welding Qualifications.

Course Outline:

Understanding Codes and Standards

- History of pressure equipment Codes
- Scope of CSA B51 Boiler
- Pressure Vessel & Pressure
- Piping Code
- Design registrations
- Owner/user programs

Considerations that Form the Basis for Code Rules

- Ductile and brittle fracture
- Elastic and plastic collapse
- Creep and stress rupture
- Fatigue
- Stress intensity (concentration)
- Corrosion and environmental assisted cracking

Composition of Steels: Introduction to API 510

- Owner/user responsibilities
- Owner's inspector responsibilities
- Determining rates of deterioration
- Determining inspection frequency
- Weld joint efficiencies

ASME VIII, Division 1

- Finding your way around in ASME VIII Div. 1
- Application and limitations of Division 1
- Responsibilities:
- Owner-user
- Manufacturer
- Authorized inspector
- Materials and components

- Listed, unlisted, unknown materials, and test reports
- Bolting
- Casting efficiency
- Specifications: ASTM standards and ASME Section II Parts A, B, C
- Determination of minimum service temperature (MDMT)
- Loading determinations and formulas for thickness requirements
- Branch connections and reinforcement
- Vessel support considerations
- Non pressure loading
- Responsibilities of fabricator
- Responsibilities and duties of the authorized inspector
- Extent of required examination
- Leak testing
- Documentation required
- Marking and identification of pressure vessels
- Pressure relief requirements
- Weld design details
- Location and types of joints
- Service restrictions
- Weld joint classification system
- Weld joint efficiencies
- Weld attachment details
- Radiographic examination
- Carbon and low alloy steel requirements

- Heat treatment
- Temper bead welding
- Other materials and special constructions
- Mandatory and Non-Mandatory