

## SECTION VIII - HIGH PRESSURE VESSEL DESIGN BY ANALYSIS, PROVIDED BY STRUCTURAL INTEGRITY ASSOCIATES

### CLASSROOM INSTRUCTORS

**Daniel T. Peters, P.E.**

Education:

- M.S. Mechanical Engineering, Gannon University
- B.S. Mechanical Engineering, Pennsylvania State University

Accreditations/Industry Leadership:

- ASME Honorary Fellow
- Pressure Vessels and Piping Division - Division Chairman and Member of Executive Committee
- ASME Codes and Standards Development - Chair Subgroup on High Pressure Vessels - Member 10 years
- Authored and Co-Authored more than 20 papers since 2001

Background:

- Mr. Peters' activities over the last 20 years have focused on the design and analysis of high-pressure equipment, including the application of fracture mechanics to the design and analysis of pressure vessels for evaluation of the life of the equipment.

### CONTACT INFORMATION

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### INTENDED AUDIENCE

1. This course is intended for pressure equipment engineers working for owner-users, manufacturing, or engineering and design firms in the high-pressure industry.
2. This may include refining, petrochemical, powdered metal, or upstream petroleum industries, who either directly use or refer to ASME Section VIII Division 3.



### TYPE

Classroom Training



### DURATION

Two days (15 PDH)

## **LEARNING OBJECTIVES**

This course provides an overview of the design by analysis methodology and philosophy of ASME Section VIII which incorporates an overview of the analysis methods used, including the application of finite element analysis, to meet the requirements of the Code and how it can be applied to practical equipment design. The focus of this course will be to emphasize the more modern and advanced analytical techniques found in ASME Section VIII Division 3 while contrasting the differences within Section VIII Division 2. An overview of philosophical differences in the high-pressure piping code, ASME B31.3 Chapter IX will also be discussed.

Examples of practical applications for many of the techniques are discussed to demonstrate the philosophy of the Code criteria. This includes an overview of the problems presented in ASME example problem manuals for ASME Section VIII. Detailed scenarios are examined to illustrate how the analytical techniques are applied, and their respective limitations. An overview of key elements of the materials, fabrication sections, a review of special construction techniques, and an overview of fatigue calculations and life assessment are also included in the discussion.

Design by Analysis has become mainstream utilizing the most advanced features of finite element analysis (FEA), cyclic life assessment, and fracture mechanics.

This course will give an overview of the ASME philosophy of using ASME Section VIII Division 2 and 3 in design of pressure vessels and pressure equipment. This will include a discussion of the inter-relationship between design, inspection, and long term asset management of equipment.

### **Topics Covered:**

- ASME Code Overview
- Vessel Design
- Materials
- Fabrication
- Examination
- Testing

## KEY INDUSTRY DOCUMENTS

1. Section VIII, Div. 2 & 3
2. API 579
3. ASME B31.3, Ch IX
4. State Specific Documents/Regulations
5. NBIC