Design-by-Rule (DBR) Methods of ASME Boiler and Pressure Vessel Code
Section VIII Division 2

A Practical, Case Study-based Training Program
Led by:

James C. Sowinski, P.E.

15 Hours • 1.5 CEUs • 15 PDHs

About this MasterClass (MC151)

This two-day MasterClass provides practical knowledge and an in-depth examination of the Design-by-Rule methods found in Part 4 of the ASME B&PV Code Section VIII Division 2 (ASME VIII-2). This course presents students with an overview of the general layout of ASME VIII-2 and discusses the use of Code Case 2695 and the Common Rule effort to incorporate Class 1 and Class 2 vessels (in ASME VIII-2). The focus of the discussions concerns the design methods of Part 4 including: Design Loads and Load Case Combinations, Design Rules for Welded Joints, Design Rules for Shells under Internal Pressure, and Design Rules for Openings in Shells and Heads. The class evaluates background and procedures found in Part 3 that are used to calculate the minimum design metal temperature (MDMT); as well as those found in Part 7 to determine the Examination Group and appropriate Nondestructive Examination (NDE) requirements. Case studies and real-world examples are reviewed in detail with active class discussion and analysis.

For more information and to register, visit
http://go.asme.org/mc151

ASME Training & Development
Setting the Standard for Workforce Learning Solutions
About this Master Class

This two-day MasterClass provides practical knowledge and an in-depth examination of the Design-by-Rule methods found in Part 4 of the ASME B&PV Code Section VIII Division 2 (ASME VIII-2). It presents an overview of the general layout of VIII-2, and discusses how to employ Code Case 2695 and the Common Rule effort to incorporate Class 1 and Class 2 vessels governed by this Code. The focus of the discussions concerns the design methods of Part 4, including Design Loads and Load Case Combinations, Design Rules for Welded Joints, Design Rules for Shells under Internal Pressure, and Design Rules for Openings in Shells and Heads. Other topics within Part 4 that are referenced include the Design Rules for Noncircular Vessels, Supports and Attachments, and Flanged Joints. The class evaluates the background and procedures described in Part 3, that explain how to calculate the MDMT; and in Part 7, to determine the Examination Group and appropriate Nondestructive Examination (NDE) requirements.

Upon completion, attendees will be able to
- Navigate efficiently through the Parts of ASME VIII–2
- Identify the circumstances under which the application of the Design-by-Rule methods of ASME VIII-2 affords beneficial cost savings to the pressure vessel design.
- Explain the difference in philosophy regarding material toughness requirements and the nondestructive examination requirements of ASME VIII–1 and ASME VIII–2.

Who Should Attend

This course is intended for pressure vessel engineers working for Owner-Users, manufacturers or engineering and design construction firms in the refining, petrochemical, and other comparable industries that desire a practical understanding of ASME VIII-2.

About this ASME Master

James C. Sowinski, P.E., is a Consulting Engineer for Equity Engineering Group with 25 years of experience in the refining and petrochemical industries and. He recognized for his expertise in the use of Fitness-For-Service (FFS) technology throughout the industry.

Mr. Sowinski performs design reviews for pressure vessels as part of major refinery capital projects, including expansions, revamps, and de-bottlenecking projects. He provides FFS evaluations to extend equipment life according to code, as well as design an analysis of pressure-containing equipment to evaluate mechanical integrity.

Mr. Sowinski is currently the Vice-Chair of ASME BPV VIII Subgroup on Design and is a member of various Code committees. He was involved in the development of the 2007 ASME B&PV Code, Section VIII, Division 2 pressure vessel code. He was a contributing author of ASME PTB–1, Section VIII–Division 2, Criteria and Commentary and the primary author of the Example Problem Manuals for both ASME PTB-3, Section VIII – Division 2, and ASME PTB-4, Section VIII – Division 1.

Mr. Sowinski earned his Bachelor of Science degree in Mechanical Engineering at Cleveland State University and is a registered professional engineer in Ohio and Texas.

MasterClass Requirements

This Master Class is structured on the assumption that participants have a basic understanding of ASME B&PV Code Section VIII, Division 2.

Attendees are encouraged to discuss actual scenarios encountered as part of a class discussion.
AGENDA

The contents are presented in 7 sessions, tentatively organized, as shown below. The two-day schedule allows for ample discussion and interaction with attendees. The instructors reserve the right to modify the content to address the audience’s needs and preferences.

Day One: 8:00 am to 5:00 pm

1. General Overview Layout of ASME VIII-2

2. Common Rules and Code Case 2695

3. Relationship of ASME VIII-2 and ASME VIII-1, paragraph U-2(g)

4. Part 3
   a. General Overview of Part 3
   b. Paragraph 3.11, Material Toughness Requirements
      i. ASME VIII-2 philosophy
      ii. Differences and why the change from ASME VIII-1 philosophy
      iii. Case Study: VIII-1 vs. VIII-2

5. Part 4
   a. General Overview of Part 4
   b. Paragraph 4.1.5.3 Design Loads and Load Case Combinations
      i. Table 4.1.1, Design Loads
      ii. Table 4.1.2, Design Load Combinations
   c. Paragraph 4.2, Design Rules for Welded Joints
      i. Weld categories, weld types, weld joint efficiencies
      ii. Table 4.2.4 – Table 4.2.14, weld joint details
   d. Paragraph 4.3, Design Rules for Shells Under Internal Pressure
      i. Development/presentation of new rules
         - Paragraph 4.3.3, Cylindrical Shells
            Case Study: VIII-1 vs VIII-2
         - Paragraph 4.3.4, Conical Shells
         - Paragraph 4.3.5, Spherical Shells
            Case Study: VIII-1 vs VIII-2
         - Paragraph 4.3.6, Torispherical Heads
         - Paragraph 4.3.7, Ellipsoidal Heads
         - Paragraph 4.3.10, Combined Loadings
            Case Study: VIII-1 vs VIII-2
         - Paragraph 4.3.11, Cone-Cylinder Junctions w/o Knuckles
            Case Study: VIII-1 vs VIII-2
         - Paragraph 4.3.12, Cone-Cylinder Junctions w/ Knuckles
Day Two: 8:00 am - 5:00 pm

5. Part 4 - continuation
   
e. Paragraph 4.4, Design Rules for Shells Under External Pressure
   i. General Overview
   
f. Paragraph 4.5, Design Rules for Openings in Shells and Heads
   i. Discussion of development/presentation of new rules
   ii. Case Study: VIII-1 vs VIII-2 Nozzle in Cylindrical Shell
   
g. Paragraph 4.12, Design Rules for Noncircular Vessels
   i. General Overview
   
h. Paragraph 4.15, Design Rules for Supports and Attachments
   i. Discussion/development and presentation rules
   ii. Case Study: Saddle Supports for Horizontal Vessels
   
i. Paragraph 4.16, Design Rules for Flanged Joints
   i. General Overview
   
j. Paragraph 4.18, Design Rules for Shell and Tube Heat Exchangers
   i. General Overview
   
k. Paragraph 4.19, Design of U-Shaped Reinforced Bellows
   i. General Overview

6. Part 7
   
a. General Overview of Part 7
   
b. Development/presentation of Examination Group
   i. Table 7.1, Examination Groups for Pressure Vessels
   ii. Table 7.2, Nondestructive Examination
   iii. Case Study: Joint Efficiencies

7. Summary and Wrap-Up