



FACT SHEET

ASME VIII | Design by Rules (DBR) vs Design by Analysis (DBA)



Course on ASME BPVC Section VIII comparing Design by Rules and Design by Analysis, addressing fundamental principles, failure modes, Code compliance, and application criteria for pressure vessels.

Who Should Attend?

This is an essential course for individuals involved with design, analysis, fabrication, purchasing, repair, and inspection of pressure vessels, as well as supervisory and regulatory personnel.

Although some knowledge of design and fabrication of pressure vessels is desirable, **previous knowledge of this subject is not required to attend the course.**

Training Objectives

The main objective of this course is **to transfer to participants the theoretical and practical skills required in projects**, obtained from experience and sound engineering practices.

Methodology

Training course with **live classes**. Instructor-led, using an adult learning approach that includes discussions, individual exercises, and simplified case studies, providing practical knowledge for implementation in the field.

Duration

The duration of this training will be determined based on the specific needs of each edition and its scope. The content will be structured into different sessions designed to facilitate progressive learning.

What to expect?

Understand **the scope and structure of the code**, including how its rules and requirements are organized and applied.

Define the **criteria** that determine when to use **Design by Rules** (Div.1 and Div.2) for the design of PV.

Identify and evaluate loads, materials, joint types, supports, and fabrication tolerances required to achieve a safe design.

Determine when **special design cases or fitness-for-service evaluations are required** and apply the corresponding assessment methodologies.

Describe and evaluate the **principles of Design by Analysis (DBA)**, including identification of failure modes.

Apply and interpret stress calculations, failure theories, and assessment methods to verify **compliance with ASME BPVC requirements and substantiate design safety.**



Contents

Intro & Evolution of BPVC

Introduction. Evolution & History

Organization of ASME & BPVC

Organization & Intro to ASME Section II: Materials

Life Cycle Management

ASME Stamp

Manufacturer Certification. Quality Requirements

National Board Inspection Code

ASME Resources

Interpretations. Code Cases

Certified Manufacturers

Publications (PTBs, STPs, WRCs, Papers, ASME VIII References - "Latest Edition")

Other general resources

Books, Papers, etc

New Fabrication Methods in VIII-1: Code Case 3113, Additive Manufacturing

ASME VIII 1 & 2 | Design by Rules (DBR)

DBR in ASME BPVC VIII Div. & Div.2

Origin, fundamentals, and philosophy of prescriptive design

Scope and applicable standards

Failure modes addressed by DBR in VIII-1 & VIII-2

Key references: UG-2(g), Appendix 45

Differences and improvements in Div 2 vs Div 1

Key changes in the 2025 Edition

Loads, design conditions and materials

Types of loads and combinations

Allowable stresses including creep considerations

Coke Drums as a loads example

Main design rules in VIII-1 & VIII-2

NDE, Joint efficiency and service requirements

Internal and external pressure, buckling

Openings, attachments, supports

Manufacturing tolerances and impact on design

Common misapplications and lessons learned

Special cases & Fitness for Service

Relevant Code Cases and API standards

Use of API 579 / ASME FFS-1 for in-service assessment

ASME VIII-2 | Introduction to Design by Analysis (DBA)

UDS: content and utility for DBA

Failure Modes

Plastic Collapse

Local Failure

Collpase from Buckling

Collapse from Cyclic Loading. Fatigue. Ratcheting

Collapse from Creep Damage

Definitions

Strength of Materials

Stress Tensors

Principal Stresses

Von Mises Stress

Failure Theories

Assessment Methods

Elastic

Limit Load

Elastic Plastic



Instructor

Highly experienced professional with **over 30 years of career experience** as an ASME Code Design Engineer, Quality Control Inspector, Quality Control Manager, Authorized Inspector, Plant Manager, and Site Operations Manager.

Extensive knowledge of the **ASME Boiler and Pressure Vessel Code (BPVC), Sections I, II, V, VIII (Div. 1 and 2), and IX; the National Board Inspection Code (NBIC); TEMA standards; the Pressure Equipment Directive (PED); API 579-1/ASME FFS-1;** and associated standards for design, fabrication, welding, inspection, and testing.

Broad experience working in diverse production environments including fabrication, welding, cutting, and machining operations.

ASME Authorized Inspector with experience in new construction, repairs, and alterations of pressure vessels.

Extensive background delivering technical training courses. **ASME Authorized Instructor.**

Tailored Training

The most effective training is one that satisfies the needs of each company's business focus and deliverables. **We adapt our training programs to each specific requirement, offering bespoke solutions for each need.** The result, 100% tailored programs, developed to maximize the time investment and deliver tangible and intangible returns to the work teams.

After an assessment phase, a tailored training plan is designed jointly with the client. This plan is specifically tailored to meet the client's needs, focusing on effectively enhancing the capabilities of the work team. **We provide practical, dynamic, and hands-on training,** making available the best instructors in each subject.

Arveng Training

Arveng Training has developed effective and practical solutions for today's industrial challenges by delivering **specific, high-quality engineering courses utilizing three different approaches: classroom, online, and tailored training.** We are proud to have imparted more than 500 classroom courses, 1800 online courses, and over 250 in-company sessions. Our training activities have benefitted over 6500 professionals, our greatest accomplishment of all.

We consider our students' time to be of utmost importance. For this reason, all our courses have been designed with the main objective of quickly improving the professional skills of the participants through our expert instructors in different disciplines. **We stimulate creativity, innovation, and initiative to make the participants inquisitive, bringing good engineering practices and lessons learned to the field, that benefits their professional lives in the long term.**

Our Company

Arveng Training & Engineering is a leading company providing Training and Engineering services based in **Madrid, Spain.** Our mission and vision are to be a leading training and engineering services company, providing our clients with the best in the sector. We are a team of highly motivated, talented, highly qualified professionals with over 20 years of experience. We aim to exceed expectations by offering efficient, innovative, cost-effective, and transparent services.

Established in July 2010, mainly oriented to the industrial sector, from the very beginning Arveng has always worked with closeness, responsibility, and commitment in all areas of activity.

Through experience gained by partaking in multidisciplinary engineering projects in sectors such as Petrochemical, Energy Generation, and Industrial, we provide answers and solutions to concrete requirements, making the effort to build long-lasting and mutually beneficial relationships.