UCC Virtual Training

Improve your knowledge and Application of the ASME BPV Code

In-depth Online Course held in 7 Virtual sessions, 2 hours each

DATE: from June 15th to June 23rd, 2020

Starting TIME of each session: 2PM Italy Time

ASME BPVC is a widely used construction code. Since many companies worldwide accept it, it is very important to stay ahead of the competition in understanding how to best take advantage of recent changes and to optimize current practices.

This virtual course will contain basic concepts as well as advanced design techniques. Multi-chamber vessels (Shell and Tube heat exchangers) will be used as the basic pressure vessel for optimized design concepts. Bonus sessions will cover optimization of mechanical design by including thermal design considerations. Examples will be provided. Attendees will be encouraged to provide their own examples and questions.

There will be quizzes throughout the difference parts.
A Certificate of Completion will be provided

Virtual Sessions

1. Part 1: The Code basics – June 15th , June 16th
   - Important Code sections
     - Editions, Interpretations, Code Cases, VIII-1, VIII-2 Classes, Part 4
     - Other design procedures outside ASME BPVC VIII
   - Multi chamber vessel types (heat exchangers)
     - Shell, front and rear head types
     - Tubes, baffle types, fluid allocation, thermal design recommendations

- Material safety factors, cost vs strength
- Joint categories, weld Joint efficiencies
- Service Types
- internal and external pressure
    - Cylinders, heads, cones, flat covers
- Nozzles, Reinforcement, external loads
- Flanges
    - Types, Loads, Stresses, Bolting, Rigidity, gaskets

2. Part 2: In-Depth Analysis

- June 17th Tubesheets/Shell/Channel/Tubes Interaction
    - Stress categories
    - Part UHX
        - Scope and Limitations
        - Untubed area
        - Tube-to-tubesheet Joints
        - Optimization of tubesheet thickness
        - Ligament efficiency, integral tubesheets, simply supported, Elastic Plastic option, Effect of flange loads, Equivalent Diameter

- June 18th U-tube Tubesheet Design
    - Why U-Tube exchangers?
    - Effect of having 1 tubesheet versus 2
    - Effect of bolted flanges
    - Example Thermal-Mechanical of a U-tube exchanger

- June 19th Fixed Tubesheet Design
    - Effect of operating conditions on axial and radial thermal expansion
    - Elastic-plastic option
    - Simply Supported design
    - Effect of expansion joints on tubesheet thickness
    - Thick-walled (TEMA type), Thin-walled (bellows)
        - Axial displacement
    - Fixed tubesheet kettles
    - Example Thermal-Mechanical of a fixed tubesheet exchanger

- June 22nd Floating Tubesheet Design

- Significance of tube buckling
- Effect of Radial Expansion
- Simply Supported design
- Example Thermal-Mechanical of a floating tubesheet exchanger

- June 23rd Special Topics
  - Differential Pressure Design
  - Double tubesheets
  - Expansion Joints
  - Maximum Allowable Working Pressure
  - Minimum Design Metal Temperature
  - Test pressure
  - Forming Strain
  - Form U-5
  - Wind and Seismic Loads (ASCE)
  - ANSI Flanges
  - TEMA Standards
  - Supports

INSTRUCTOR - Aurioles Gabriel

Gabriel Aurioles is currently **Technology Director for Aspen Technology** and has over 40 years of experience in the design of shell and tube heat exchangers and pressure vessels. He is the current **Chairman of the ASME Subgroup on Heat Transfer Equipment** and a **member of the Boiler and Pressure Vessel Committee** and various other ASME code committees. His participation in ASME Committees spans over 20 years, and he was instrumental in the development and testing of Part UHX. Mr Aurioles is also an ASME Fellow, a Membership Grade of Distinction
Mr. Aurioles is involved in development of *heat exchanger optimization technology* using ASME as well as other internationally recognized safety and construction codes. He is an expert in software algorithms and principal architect of engineering software for the design of shell and tube heat exchangers. His expertise includes the application of materials, fabrication, inspection, and design requirements for Code compliance. Mr. Aurioles earned his bachelor's degree in chemical engineering from the University of Florida and an MBA from Virginia Commonwealth.

ASME Committees:

TOMC – Member (Technical Oversight Management Committee)
BPV VIII Exec – Member (Executive Committee)
BPV VIII – Member (main committee)
BPV VIII SG HTE – Chair (Heat Transfer Equipment)
BPV VIII- TG1RW - Chair (Division 1 Rewrite Project)
BPV VIII SWG BFJ – Member (Bolted Flange Joint)
BPV VIII TG U-2(g) – Member (applicability of other design methods)
BPV VIII SG Interpretations - Member
BPV II SG Physical Properties - Member
BPV VIII SG D – Member (Design) 21-22-23 October 2019