Bases and Application of Piping Flexibility Analysis to ASME B31 Codes *(MC110)*

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

Jim E. Meyer, PE

15 Hours • 1.5 CEUs • 15 PDHs

About this MasterClass

This two-day MasterClass provides an in-depth review of the rules and practical application of piping analysis requirements in the ASME B31.1 Power Code and ASME B31.3 Process Piping Code that can have a significant impact on design. The program will highlight detailed example problems that demonstrate, for "real world" piping, how design and analysis and modeling assumptions can affect the results.

For more information and to register, visit
go.asme.org/mc110

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ASME MasterClass Series

The ASME MasterClass Series focuses on applications and case studies of a particular topic. Each MasterClass is led by an ASME Master, an expert in his professional discipline, who brings a wealth of knowledge and practical examples to the forum. Participants are expected to have prior knowledge of the topic area to gain the most from this interactive environment.

Sessions are focused on real world examples and case studies, with active class discussion and analysis.

About this MasterClass

The rules of B31.1 and B31.3 have considerations that can have a significant impact on the design of systems and associated equipment. This interactive two-day MasterClass will provide a thorough insight into the history and bases for the rules for piping design. The program will provide a review of the detailed design procedures and a thorough explanation of the significant assumptions and available options. Through both presentation and discussion, attendees will gain a greater appreciation and understanding of how these assumptions and options can impact their designs.

The class will include detailed example problems that demonstrate, for "real world" piping, how the rules are to be applied and how the options can influence the final design. Examples will be reviewed showing how outputs from computer analysis can be broken down into understandable pieces and verified that the results are consistent with the actual behavior of the piping system.

Upon completion, attendees will be able to

- Define the analytical basis of piping design rules contained in either the ASME B31.1 Power Piping Code or ASME B31.3 Process Piping Code.
- Evaluate the significance of the modeling assumptions and how they affect the final design.
- Apply the step-by-step design logic for reviewing stress analysis outputs and understanding how to locate and resolve problems.
- Interpret the significance of the calculated stresses and the importance of stress categories.

Who Should Attend

This MasterClass is an essential resource for piping engineers/designers, developers of piping analysis design software, as well as managers/supervisors of piping design activities.

About this ASME Master

Jimmy E. Meyer, PE has over 40 years of experience in refining petrochemical, chemical, power generation and industrial facilities. He is a principal engineer at Louis Perry and Associates, a full service engineering and architectural firm, located in Wadsworth Ohio. Jim is experienced in overall project coordination/management, pressure equipment, piping design, analysis, specifications, support design, mechanical system requirements and documentation requirements. In particular, areas of his technical competence include ASME piping and pressure vessel codes, stress analysis, field troubleshooting piping system support, vibration, and expansion problems.

Jim is a member of ASME and has been involved in the ASME B31.1 and ASME B31.3 Section committees for over 35 years. He is currently Chair of the ASME B31.3 Process Piping Section Committee, Chair of the ASME B31 Standards Committee, and serves on the ASME Board on Pressure Technology Codes and Standards. Jim has also served as Chair of ASME B31.1 Power Piping Code Section Committee.

Most recently, Jim co-authored chapters in the *ASME Boiler and Pressure Vessel Companion Guide*, 4th Edition, covering the ASME B31.1 Power Piping Code and the B31.3 Process Piping Code. Past projects and work experience has involved major oil refineries, petrochemical plants, fossil, nuclear, solar and alternative energy generation, as well as cryogenic and vacuum test facilities.

MasterClass Requirements

This MasterClass is structured on the assumption that participants have a basic understanding of ASME B31.1 or B31.3 Piping Codes.

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AGENDA

The contents are presented in 8 sessions, tentatively organized as shown. 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: 8:00am – 5:00pm

Review of Design Criteria and Piping Analysis Requirements 8:00am-10:00am

- History of Piping Code Requirements
- Analysis options advantages of different approaches

Coffee Break 10:00am-10:15am

Basic of Analysis Modeling Assumptions 10:15am-12pm

- Design for Friction versus including in analysis model
- Significance of Calculated Stresses
- Significance of Calculated Loads and Load Cases
- Interface with equipment and other piping systems

Lunch Break 12:00pm–1:00pm

Parameters Affecting Interface Loads 1:00pm-3:00pm

- Anchor Stiffness
- Support Stiffness and Gaps
- Expansion Joints
- Non-linear restraints and boundary conditions

Coffee Break 3:00pm-3:15pm

Detailed Review of Design Analysis Outputs 3:15pm-5:00pm

(End of Day One)

Day Two: 8:00am – 5:00pm

Design Procedure – cont'd 8:00am-10:00am

- Expansion joints in analysis and hand calculations

Coffee Break 10:00am-10:15am

Design Procedure – cont'd 10:15am-12:00pm

- Procedures and techniques for checking piping analysis
- Importance of control points in piping models
- Truly checking analysis versus stopping when you get the answer you want to hear

Lunch Break 12:00pm–1:00pm

Worked Examples 1:00pm-3:00pm

- Large diameter models
- Small piping and decoupling methods
- SIF and Flexibility factors

Coffee Break 3:00pm-3:15pm

Example Problems – continued 3:15pm-4:30pm

- Evaluating sensitivity of models

Summary and Wrap-up 4:30pm-5:00pm

(End of Day Two)