



ASME Section VIII, Division 2 – Part 5, Design-By-Analysis

Potential PDH: 32

Description:

Becht Engineering's Design-By-Analysis course will introduce participants to the Design-By-Analysis portion of the ASME code Section VIII, Division 2, Part 5. Based on the rules and guidance provided in Part 5, this course is a comprehensive introduction to the requirements of performing Design-By-Analysis to the ASME Code. This course provides detailed instruction on performing finite element analysis in compliance with the Code. Example problems are presented and discussed for many of the common rules. This course is intended for engineers who are familiar with pressure vessel and piping design, and need additional guidance on applying Design-By-Analysis concepts. Experience with finite element analysis is not required, but an understanding of the fundamentals would be an asset.

Outline:

1. General Philosophy: Protection Against Failure Modes
2. Load Conditions and Load Case Combinations
3. Protection Against Plastic Collapse
 - Elastic Analysis
 - Linearization of Stress Results for Stress Classification
 - Limit Analysis
 - Elastic-Plastic Analysis
 - Elastic-Plastic Stress-Strain Curve Development
4. Protection Against Local Failure
5. Protection Against Collapse from Buckling
 - Current rules overview (limited)
 - Upcoming rule changes (detailed)
6. Protection Against Failure from Cyclic Loading: Ratcheting
 - Elastic Analysis
 - Elastic-Plastic Analysis
7. Protection Against Failure from Cyclic Loading: Fatigue
 - Screening for exemption from fatigue analysis
 - Elastic Fatigue Analysis
 - Elastic-Plastic Fatigue Analysis
8. Protection Against Failure from Cyclic Loading: Fatigue of Weldments



- Fatigue Strength Reduction Factor
 - Structural Stress Method
9. Histogram Developments and Cycle Counting for Fatigue Analysis
 10. Introduction to Part 4 – Design By Rules
 11. FEA / Part 5 Report Discussion

Subject Matter Expert (SME):

Trevor Seipp has over twenty-three years of experience in design, analysis, review, and failure analysis of process and power equipment, piping and structures. Extensive analytical experience includes linear and non-linear finite element analysis using ANSYS and ABAQUS, buckling analyses, steady state and transient heat transfer and thermal stress analysis of pressure vessels and piping, fitness-for-service evaluations, fatigue assessments, and flexibility. In his current role with Becht, he has performed many evaluations using finite element analysis. He has developed a 4-day course on Design-By-Analysis using ASME Section VIII, Division 2, Part 5 and has presented the course around the world. Mr. Seipp is also involved in ASME Codes and Standards, serving on the ASME Board on Pressure Technology Codes and Standards, as well as serving as a member of the Subgroup on Design of Section VIII, Subgroup on Interpretations of Section VIII and the Working Group on Design-By-Analysis of Section VIII. For the ASME Pressure Vessels and Piping Division, Mr. Seipp has served as past-Chair of the Design and Analysis Technical Committee, past-Chair of the Division Honors and Awards Committee, Technical Program Chair for PVP2019, Conference Chair for PVP2020, and Chair of the PVP Division for 2020-2021. Mr. Seipp is a Fellow of ASME. Mr. Seipp is also extensively published at peer-review conferences and journals. He has authored 30 conference papers and presentations to several international conferences, published 4 journal articles, and presented several tutorials at ASME Conferences. Before joining Becht, he worked for Fluor, Syncrude, Wascana Energy, and Imperial Oil. Mr. Seipp received his M.Sc. in Aerospace Engineering from the University of Minnesota and his B.Sc. in Mechanical Engineering from the University of Saskatchewan. He is a licensed professional engineer in Alberta, Saskatchewan and Ontario, and a responsible member for the Alberta Permit to Practice and the Saskatchewan and Ontario Certificates of Authorization.