Repair Strategies and Considerations for Pressure Vessels and Piping

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

David A. Osage
J. Ryan Jones

7.5 Hours • 0.75 CEUs • 7.5 PDHs

About this Master Class *(MC114)*

This one-day MasterClass provides the engineer with an in-depth overview of various strategies and considerations for repairs of pressure equipment and piping and how this fits in the overall life cycle management of equipment. This course includes: a review of the applicable ASME Codes, API Standards, NBIC Standards, and other applicable documents that can be drawn on for repairs; some examples of repair strategies; considerations how additional analysis can be used to make effective repairs; and additional considerations for when equipment should be replaced. An overall method for approaching repairs and assessments will be presented.

For more information and to register, visit
go.asme.org/mc114

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ASME MasterClass Series

The ASME Master Class Series focuses on applications and case studies of a particular topic. Each Master Class 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 Master Class

The focus of the one-day Master Class is to provide an overview of the many different documents (codes, standards, industry guidelines) that exist to help equipment owners make sound repairs to pressure equipment.

Guidance for repairs can come from a number of sources:

- Original design codes (typically ASME)
- Post Construction codes (ASME PCC-2, etc.)
- API Standards (API 510, API 570, API 653, API-579, etc.)
- NBIC Standards
- Other state or industry regulations

Knowing when to use these documents and how to use them together can develop a strong toolbox of repair options.
Also presented are proven methods on how to approach repairs and evaluations: understanding the damage mechanism, understanding the loads involved, and managing the risk.

Upon completion, attendees will be able to

- Select repair methods based on the equipment and situation.
- Describe how the different Codes, Standards, and Regulations can be applied to assess damage conditions and make cost-effective repair-or-replace decisions

Who Should Attend

This course is intended for Owner-User engineers or contractors responsible for the Life Cycle Management of pressure vessel, piping, and tanks. Engineers and inspectors responsible for evaluating damage and determining repair strategies will also benefit.

MasterClass Requirements

Prior to the event, attendees will be given the opportunity to submit questions or examples of real-life scenarios they have faced to be discussed with the group.

This Master Class is structured on the assumption that participants have a basic understanding of ASME Design Codes and equipment terminology.

About this ASME Master

David A. Osage, P.E.,
is internationally recognized for his expertise in the design of new equipment and as an industry expert and leader in the development and use of FFS technology. He is the President and CEO of The Equity Engineering Group, Inc. and has over 30 years of experience in the refining and petrochemical industries. As the lead investigator and principal author of API 579-1/ASME FFS-1 and the new ASME B&PV Code, Section VIII-Rules for Construction of Pressure Vessels Division 2-Alternative Rules, he developed a new organization and writing style for these standards and was responsible for introducing the latest technologies for evaluation of in-service pressurized components and for the construction of new pressurized components. These technologies include models for materials behavior, updated design-by-rule methods, modern harmonized FFS and design-by-analysis procedures including the introduction of elastic-plastic analysis methods, and a new fatigue method for welded joints. Mr. Osage received a Certificates of Acclamation from ASME for this work. He has served on several API and ASME BPV VIII Code Committees. Mr. Osage earned his Bachelor and Master's degree in Mechanical Engineering at Stevens Institute of Technology, Hoboken, NJ in 1977. He is a registered professional engineer in Ohio.

J. Ryan Jones, P.E.,
is a consultant and Director of the Mechanical Engineering Business Unit at The Equity Engineering Group, Inc. and has over 15 years of experience in the petrochemical and refining industries. Mr. Jones brings a depth of experience covering the full project life-cycle including design/procurement activities, construction/commissioning activities, plant maintenance activities, and failure analysis / Fitness-For-Service / decommissioning activities in petrochemical environments. Mr. Jones uses advanced engineering principles and analysis tools to solve design or operational problems in the most practical, cost-effective manner. Mr. Jones is a member of the ASME Post Construction Code Committee for *Repair of Pressure Equipment and Piping (ASME PCC-2)*. Mr. Jones earned his Bachelor Degree in Mechanical Engineering at The University of British Columbia, Canada. He is a registered professional engineer in a number of Canadian Provinces.

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AGENDA

The contents are presented in 4 sessions, tentatively organized as shown. The one-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.

Overview of Existing Industry Documents 8:00 AM – 10:00 AM

- Construction Codes (ASME, API)
- In-Service Standards (API)
- Post Construction Codes (ASME PCC2, etc)
- Jurisdictional Standards (NBIC-23)
- API 579-1/ASME FFS-1
- Owner-User Best Practices

Coffee Break 10:00 AM – 10:15 AM

General Approach to Evaluations/Repairs 10:15 AM – 12 Noon

- Understanding the damage (why do you need to repair? when is it better not to repair?)
- What loads need to be considered? How would the component fail?
- NDE and inspection considerations
- Considering the risks
- How to make the run/repair/replace decisions
- How does the repair fit into the overall life cycle management process for the equipment?

Lunch Break 12:00 PM – 1:00 PM

Welded Repairs and Non-Welded Repairs 1:00 PM – 3:45 PM

- ASME PCC-2 Overview
- NBIC Details and Options
- Post Weld Heat Treat considerations
- "Old" versus "New" pressure vessels
- Welding considerations

Coffee Break 3:45 PM – 4:00PM

Alternatives to Repairs/Optimization of Repairs 4:00PM – 5:00PM

- API 579-1/ASME FFS-1
- Use of analysis to minimize repairs and/or minimize risks associated with repairs