

PRESSURE VESSEL & PIPING FAILURES: CAUSES, MITIGATION AND REPAIR

A Case Study Learning Series

A Plant objective is to attain the maximum economic benefit and service life from existing equipment without sacrificing integrity. This requires accurate assessment of the condition of the equipment and their suitability for operability.

LEARN IT RIGHT FROM THE ASME EXPERTS.

The PVP Failure Modes Program offers a series of case study-based courses, with each course addressing the fundamentals of a damage mechanism, their causes and characteristics, method of inspection to detect the extent of damage, and the methods and criteria to evaluate the component's fitness-for-service. Rules and application of ASME and API Codes as well as other industry regulations are discussed in making run-or-repair decisions.

This program is an essential resource for engineers, inspectors, and regulators who desire a practical roadmap for making run-or-repair and operability decisions based on the sound application of ASME/API codes, industry regulations, and engineering practice.

MAY 2018 – HOUSTON, TX		
May 21	8:00am–5:00pm	PVP Integrity Assessment and Repair Using ASME/API Codes and Industry Regulations – an Overview (MC152)
May 22	8:00am–5:00pm	Failure Mode: General Metal Loss Corrosion (MC153)
May 23	8:00am–12:00pm	Failure Mode: Local Thin Areas (MC154)
May 23	1:00pm–5:00pm	Failure Mode: Pitting Corrosion (MC155)
May 24	8:00am–5:00pm	Failure Mode: Stress Corrosion Cracking (MC156)
May 23-24	8:00am–5:00pm	Failure Mode: Piping Vibration (MC111)
May 25	8:00am–5:00pm	Failure Mode: Waterhammer Damage in Pipes (MC158)

For more information and to register,
go to **GO.ASME.ORG/PVPFAILURES**

REAL CASE STUDIES. REAL

PVP INTEGRITY ASSESSMENT AND REPAIR USING ASME/API CODES, AN OVERVIEW (MC152)

May 21, 8:00am - 5:00pm

This one-day course introduces the approach to Integrity Assessment and repairs of fixed equipment (tanks, vessels, and piping systems) across industries, including the chemical process industry, oil-gas pipeline industry, refineries and petrochemicals, nuclear power, and fossil power plants.

You will learn about:

- The codes, standards, and regulations related to integrity and repairs that govern each industry
- The contents and general approach of the various codes and standards on integrity assessment and repairs
- The damage and degradation mechanisms that are covered in the various codes and standards
- The repair techniques that are covered in the various codes and standards
- The role of the owner, the designer, and the jurisdiction
- Ongoing developments with ASME Codes on Integrity Assessment and Repairs of Pressure Equipment

PVP FAILURE MODE: GENERAL METAL LOSS CORROSION (MC153)

May 22, 8:00am - 5:00pm

This one-day course reviews the causes and characteristics of General Metal Loss Corrosion, how to diagnose their causes, how to determine the integrity of the system or component, how to decide whether to keep the system or component in service, and how to repair and prevent recurrence. In making these assessments, guidance available in ASME Codes and other industry regulations are discussed, as well as what is not addressed in codes and regulations, and is therefore at the discretion of the engineer.

You will learn how to:

- Recognize the type and causes of General Metal Loss Corrosion
- Apply the correct NDE technique to characterize the corrosion
- Estimate the corrosion rate
- Evaluate the remaining life of the component, based on API-579/ ASME FFS-1 and ASME XI
- Make run-or-repair decisions
- Select the repair technique in accordance with ASME PCC-2, API-510 & 570, API-653 and Steel Tank Institute Standards

PVP FAILURE MODE: LOCAL THIN AREAS (MC154)

May 23, 8:00am - 12:00pm

This half-day course reviews the causes and characteristics of Local Thin Areas, how to diagnose their causes, how to determine the integrity of the system or component, how to decide whether to keep the system or component in service, and how to repair and prevent recurrence. In making these assessments, guidance available in ASME Codes and other industry regulations are discussed, as well as what is not addressed in codes and regulations, and is therefore at the discretion of the engineer.

You will learn how to:

- Recognize the type and causes of Local Thin Areas
- Apply the correct NDE technique to characterize the corrosion
- Estimate the corrosion rate
- Evaluate the remaining life of the component based on API-579/ ASME FFS-1 and ASME XI
- Make run-or-repair decisions
- Select the repair technique in accordance with ASME PCC-2, API-510 & 570, API-653 and Steel Tank Institute Standards

ISSUES. REAL SOLUTIONS.

PVP FAILURE MODE: PITTING CORROSION (MC155)

May 23, 1:00pm - 5:00pm

This half-day course reviews the causes and characteristics of Pitting Corrosion, how to diagnose their causes, how to determine the integrity of the system or component, how to decide whether to keep the system or component in service, and how to repair and prevent recurrence. In making these assessments, guidance available in ASME Codes and other industry regulations are discussed, as well as what is not addressed in codes and regulations, and is therefore at the discretion of the engineer.

You will learn how to:

- Recognize the type and causes of Pitting Corrosion
- Apply the correct NDE technique to characterize the corrosion
- Estimate the corrosion rate
- Evaluate the remaining life of the component based on API-579/ASME FFS-1 and ASME XI
- Make run-or-repair decisions
- Select the repair technique in accordance with ASME PCC-2, API-510 and 570, API-653 and Steel Tank Institute Standards

PVP FAILURE MODE: STRESS CORROSION CRACKING (MC156)

May 24, 8:00am - 5:00pm

This one-day course reviews the causes and characteristics of Stress Corrosion Cracking (SCC), how to diagnose their causes, how to determine the integrity of the system or component, how to decide whether to keep the system or component in service, and how to repair and prevent recurrence. Prediction of SCC onset and progression are discussed in detail, as well as failure assessments and repair options.

You will learn how to:

- Recognize the type and causes of Stress Corrosion Cracking
- Apply the correct NDE technique to characterize the corrosion
- Estimate the corrosion rate
- Evaluate the remaining life of the component based on API-579/ASME FFS-1 and ASME XI
- Make run-or-repair decisions
- Select the repair technique in accordance with ASME PCC-2, API-510 and 570, API-653 and Steel Tank Institute Standards

PVP FAILURE MODE: PIPING VIBRATION (MC111)

May 23-24, 8:00am - 5:00pm (daily)

This two-day course provides a foundation of knowledge necessary for those responsible for assuring the mechanical integrity of existing piping systems, as well as those responsible for designing and constructing new piping systems. The program reviews fundamental causes of piping vibration and describes how to identify sources of vibration. Rules of thumb and simplified methods for evaluating vibration severity, as well as methods of treatment are discussed. A wide variety of causes of vibration will be explored in detail in order to enable the participant to properly evaluate the variety of piping vibration problems that can occur in piping systems.

You will learn how to:

- Identify the probable causes of piping vibration
- Assess severity of vibration
- Recommend solutions to vibration problems
- Make run-or-repair decisions

*IACET CEUs will be awarded upon completion of each course.



ASME Learning & Development is accredited by the International Association for Continuing Education and Training (IACET). ASME Learning & Development complies with the ANSI/IACET Standard, which is recognized internationally as a standard of excellence in instructional practices. As a result of this accreditation, ASME Learning & Development is authorized to issue the IACET CEU.

PVP FAILURE MODE: WATERHAMMER DAMAGE IN PIPES (MC 158)

May 25, 8:00 am - 5:00 pm

This one-day course reviews the causes and characteristics of Waterhammer Damage in Pipes, how to diagnose its causes, how to determine the integrity of the system or component, how to decide whether to keep the system or component in service, and how to repair and prevent recurrence. Assessment of severity is discussed in detail as well as prevention and mitigation options.

You will learn how to:

- Recognize the type and causes of Waterhammer Damage in Pipes
- Assess severity of damage
- Evaluate the remaining life of the component
- Make run-or-repair decisions

“It provided a good balance of technical depth and practical experience. It gave me a better understanding of Materials Behavior with Failure Modes.”

- Bob Courtney, *PBF Energy*



MEET THE INSTRUCTORS



DON FRIKKEN is a Member and Past Chair of ASME B31 Pressure Piping Committee. A Senior Advisor at Becht Engineering, Don is an internationally recognized authority in piping design and has received numerous awards including the ASME Melvin R. Green Codes and Standards Medal, which recognizes outstanding contributions in ASME Code development.



GEORGE ANTAKI is an ASME Fellow with over 40 years of experience in mechanical and structural integrity in the power and process industries. He is internationally recognized for his expertise in design, analysis, and fitness-for-service evaluation of pressure equipment and piping systems. George is chairman of ASME III Working Group Piping Design, chairman of ASME B31 Mechanical Design Committee, member of the joint API-579/ASME FFS-1 committee, and the ASME Post-Construction Code. He has authored three textbooks on the design, trouble-shooting, fitness-for-service, and repair of pressure equipment.



TONY SCRIBNER is a recognized authority in Materials Engineering and Corrosion Control in the Chemical Process Industries. He has forty years of experience in failure analysis, materials selection, design of equipment to minimize corrosion, troubleshooting and process modifications to minimize corrosion. He has led and been the technology lead for the Materials Engineering function for Union Carbide for more than 30 years and oversaw the development of specifications for five technology areas. He is an associate director of the Materials Technology Institute.

For registration assistance, contact
ASME Customer Support Group at 1-973-244-2213