MERCURY

Seminar of Process Equipment & Piping Systems: Application, Design, Failure Prevention & Repairs

31 January – 4 February 2027
Sharm El-Sheikh (Egypt)



Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

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Ref: 8207_1080521 **Date:** 31 January – 4 February 2027 **Location:** Sharm El-Sheikh (Egypt) **Fees:** 4500 Euro

Introduction:

Process equipment and piping systems are vital in various industries, such as oil and gas, chemical processing, and power generation. These systems are critical to efficiently and safely handling fluids and gases. The process equipment, piping systems, design, and repair techniques conference focuses on applying equipment piping, equipment systems, and piping systems.

This process equipment, piping systems, design, and repair techniques seminar also provides insights into piping and equipment design and the intricacies of process piping. It emphasizes the importance of understanding failure mechanisms to prevent downtime and losses.

The process equipment, piping systems, design, and repair techniques seminar is an opportunity to delve into the world of process equipment and piping systems, detailing everything from their design and operation to failure prevention and repairs.

Enhancing Equipment and Piping System Reliability in the Oil and Gas Industry:

The process equipment, piping systems, design, and repair techniques seminar focuses on the application, design, and maintenance of equipment and piping systems in the oil and gas industry. Participants will explore the best practices in equipment application and piping design, which are pivotal for ensuring the safety and efficiency of oil and gas production equipment.

Preventing piping failure is a significant concern in the industry, given its direct impact on safety and profitability. The process equipment, piping systems, design, and repair techniques seminar aims to impart knowledge enabling participants to make informed decisions regarding equipment repairs and failure prevention in the context of the demanding environments of the oil and gas sector.

Targeted Groups:

- Process, Mechanical and Chemical Engineers
- Operation and Maintenance Engineers
- Project Engineers
- Supervisors and Managers
- Technical Personnel involved in the inspection, operation, and maintenance of equipment and piping in the oil and gas industry and other sectors reliant on process equipment and piping infrastructure.

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Seminar Objectives:

At the end of this process equipment, piping systems, design, and repair techniques seminar, the participants will be able to:

- Understand that the mechanical integrity of process equipment depends on the proper design, operation, condition assessment, and maintenance.
- Identify equipment degradation mechanisms and their management, ensuring safe and continuous oil and gas production equipment operations.
- Gain skills in damage analysis and failure prevention in equipment and piping systems and techniques for plumbing pipe repair where feasible.

Targeted Competencies:

At the end of this process equipment, piping systems, design, and repair techniques seminar, the target competencies will be able to:

- Work knowledge in the mechanical design of pressure equipment and piping systems.
- The Inter-dependence of Design, Operation, and Maintenance for Achieving Mechanical Integrity of Pressure Equipment and Piping Systems.
- Understand, predict, and identify degradation and damage mechanisms that affect process equipment fitness for continued service and could result in significant potential failures.
- Apply risk-based inspection - API 580.
- NDT methods and their practical application.
- Perform fitness-for-service assessments - API 579.
- Failure Investigation Techniques and Root Cause Analysis.

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Seminar Content:

Unit 1: Failure Mechanics:

- Wear and Failure Mechanisms.
- Imperfections and Defects.
- Corrosion Mechanisms.
- Failure Modes.
- Fatigue.
- Fret.
- Creep and Thermal Fatigue.
- Stress Corrosion Cracking, Other modes.
- Carbon and Alloy Steels.
- Nickel, Titanium, and Specialty alloys.
- Aluminum and Aluminum Alloys.
- Copper and Copper Alloys.
- Plastic piping.
- Alternative Options-linings, Cladding.
- Limitations and safeguards.
- Material Selection - Economics-life Cycle Costing.
- Material Properties and Selection.

Unit 2: Failure Prevention By Design:

- Failure Causes - Design, Operation, Maintenance, Other Causes.
- Material properties and selection.
- Physical Properties and Limitations of Components.
- Physical Properties of Steel and Alloy Piping and Tubing.
- Physical properties of fittings.
- Basic Design.
- Pressure Vessels.
- Piping Systems.
- Liquid Storage Tanks.
- Operation and Maintenance of Process Equipment.
- Damage Mechanisms Affecting Process Equipment.

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Unit 3: Process Equipment Failures:

- Failures in Pressure Vessels, Piping, and Boilers.
- Strength reduction through material loss.
- Case histories.
- Piping System Vibration.
- Mechanical and Flow-Induced Resonance.
- Transient Hydraulic pulsation.
- Pipe supports and restraints.
- Wind Loading.
- Industry Practices for Failure Prevention.

Unit 4: Inspection, Assessment, and Maintenance:

- Inspection Strategies Plans and Procedures - Risk-Based Inspection API 580.
- Developing an RBI Plan.
- Fitness-For-Service Assessment API 579.
- NDT Methods and Techniques.
- Probability of Detection.
- Damage Characterization.
- Select the correct techniques.
- Smart pigging.
- Cleaning.
- Operational procedures.
- Pigging of Pipelines.

Unit 5: Operation and Maintenance:

- Maintenance Programs.
- Repair and Alteration of Pressure Equipment and Piping.
- Rerating Piping and Pressure Vessels.
- Estimation of Consequences of Pressure Vessels and Piping Failures.
- Failure Analysis Techniques.