

Scandinavian Academy
Training Center

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Riyadh - Al Khaleej District - Sheikh Abdul Aziz Bin Abdul Rahman Bin Bishr Street - 13223 - Office No. 5 | P.O.BOX : 13224

Course: Process Equipment & Piping Systems

Code	City	hotel	Start	End	price	Language - Hours
CM-641SA	Al Baha	Hotel Meeting	2027-08-29	2027-09-02	13950 SR	En - 25

Why Choose this Course?

This course is designed to provide practical aspects of the mechanical design of pressure vessels, storage tanks, thermal equipment, piping systems and fluid transport machinery. The course will discuss the performance of these components under various operating conditions including in-depth explanation on the process of material degradation such as corrosion, erosion, fatigue and others that may lead to component failure.

Several examples and case studies included in the workshops and will demonstrate the application of Fitness for Service (FFS) assessment method that enables quantitative evaluation of the remaining life in service of any component of equipment. Failure prevention methods will also be discussed and explained.

The course will feature:

- Explanation of mechanical design of pressurized equipment according to ASME Code
- Consideration of best operating conditions: Integrity Operating Window and MOC
- Analysis of damage and degradation mechanisms that affect process equipment and piping
- Guidance for selecting the most appropriate inspection method based on API code guidelines
- Procedure for assessing the existing flaws and defects in the given component

What are the Goals?

By the end of this course, participants will be able to:

- Understand the safe design and operation of pressurized process equipment
- Follow the procedure for inspection and testing of process equipment
- Apply the fundamental concepts and strategies to prevent failures
- Use the best practices of FFS to estimate the remaining life of operating equipment
- Select the methods of repair and alteration of pressurized process equipment

Who is this Course for?

This course is designed to benefit all levels of Technical Personnel in the oil and gas industry as well as in chemical and process industries but will greatly benefit:

- Process, Mechanical and Chemical Engineers
- Operation and Maintenance Engineers
- Project Engineers
- Supervisors and Managers
- Technical Personnel involved in inspection

How will this be Presented?

This course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. This includes formal lectures and interactive worked examples with active contribution of all delegates during discussions and team work. Real life examples (i.e. case studies) will be selected to illustrate the procedure for carrying out typical equipment failure analysis.

The emphasis in the entire course will be on the explanation of equipment failure

causes and safety operation system as well as providing answers to problems that is encountered in everyday practice. There will be ample opportunities for open discussion and sharing professional experiences on existing and new technologies.

The Course Content

Day One

Overview of Design Features of Process Equipment and Piping System

- General Concept of Safety in Design: Codes and Standards
- Design Features of Pressure Vessels and Storage Tanks
- Design Features of Piping Systems
- Design Characteristics of Fluid Handling Equipment
- Design Characteristics of Thermal Equipment
- Overpressure Protection of Equipment

Day Two

Overview of Operation Issues of Components of Process Equipment

- Safe Operation of Process Equipment: Integrity Operating Window
- Over-pressuring of Process Equipment
- Uncontrolled Runaway Chemical Reaction
- Overheating of Boiler Tubes
- Abnormal Operation of Fluid Handling Equipment
- Vibration of Piping Systems

Day Three

Failure Modes and Fracture Mechanisms

- Characteristics of Material Used for Construction of Process Equipment
- Material Degradation Processes
- Causes of Failures of Process Equipment and Piping Systems
- Failure Modes
- Fracture Mechanisms
- Lessons Learnt from Major World Equipment Failures

Day Four

Design and Operation of Fluid Handling Equipment

- Condition Monitoring
- Inspection and Testing Techniques: API 572, API 510, API 570
- Risk Based Inspection (RBI): API 580
- Fitness for Service Assessment: API 579/ASME FS1
- Failure Evaluation and Calculation of Component Remaining Life
- Failure Prevention Methods

Day Five

Repairs, Alterations and Rerating of Process Equipment

- Classification of Repairs
- Repair Best Practices for Pressure Vessels and Other Equipment
- Rerating of Pressure Vessels
- Hot Taping and Line Stopping

Positive Material Identification (PMI)

The Scandinavian Academy for Training Center adopts the latest scientific and professional methodologies in training and human resource development, aiming to enhance the efficiency of individuals and organizations. Training programs are delivered through a comprehensive approach that includes:

- Theoretical lectures supported by PowerPoint presentations and visual materials (videos and short films).
- Scientific evaluation of participants before and after the program to measure progress and knowledge acquisition.
- Brainstorming sessions and practical role-playing to simulate real-life scenarios.
- Case studies tailored to align with the training content and participants work nature.
- Assessment tests conducted at the end of the program to evaluate the achievement of training objectives.

Each participant receives the training material (both theoretical and practical) in printed form and saved on a CD or flash drive. Detailed reports, including attendance records, final results, and overall program evaluations, are also provided.

Training materials are prepared professionally by a team of experts and specialists in various fields. At the end of the program, participants are awarded a professional attendance certificate, signed and accredited by the Scandinavian Academy for Training Center.

Program Timings: 9:00 AM to 2:00 PM

The program includes:

- A daily buffet provided during the sessions to ensure participants comfort.
- A closing ceremony on the final day to distribute certificates and celebrate participants achievements.
- **Note: All prices are exclusive of 15% Value Added Tax (VAT).**

Our Success Partners

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