TRAINING TITLE
GAS COMPRESSION SYSTEM DESIGN

Training Duration
5 day

Training Venue and Dates

Ref. No. PE113	Gas Compression System Design	5	29 Sep-03 Oct 2025	$5,500	ABU DHABI, UAE

In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees
- **$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch**

Training Certificate
Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION
Gas compression systems are vital components in the oil and gas industry, facilitating the transport, processing, and storage of natural gas. From upstream production facilities to midstream pipelines and downstream processing plants, efficient and reliable gas compression systems are critical for maintaining flow, reducing bottlenecks, and meeting operational requirements.

The "Gas Compression System Design" course is a comprehensive 5-day program designed to equip engineers and professionals with the technical expertise needed to design, optimize, and troubleshoot gas compression systems. The course covers the fundamental principles, selection criteria, equipment design, operational challenges, and emerging technologies to ensure participants are well-prepared to handle real-world challenges in gas compression applications.

TRAINING OBJECTIVES
By the end of the course, participants will be able to understand

- **Learn the principles of gas compression, including thermodynamics and gas flow behavior.**
- **Understand the design, sizing, and selection of compressors for various applications.**
- **Gain insights into troubleshooting and optimizing compressor performance.**

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- **Explore the integration of gas compression systems with processing plants and pipelines.**
- **Stay updated on the latest advancements in compressor technology and control systems.**

WHO SHOULD ATTEND?

This course is designed for:

- Process and mechanical engineers involved in gas compression.
- Project and facility design engineers.
- Operations and maintenance professionals.
- Equipment and reliability engineers.
- Anyone working in gas processing, transmission, or storage.

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

COURSE PROGRAM:

Day 1: Fundamentals of Gas Compression

- **Introduction to Gas Compression in the Oil and Gas Industry**
- **Thermodynamic Principles: Gas Laws, Compressibility, and Heat Effects**
- **Overview of Gas Compression Systems and Their Applications**
- **Types of Compressors: Centrifugal, Reciprocating, Screw, and Axial**
- **Compressor Performance Curves and Selection Criteria**
- **Case Study: Application of Compressors in Natural Gas Gathering**

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Day 2: Compressor Design and Sizing

- Compressor Design Basics: Flow Rate, Pressure Ratios, and Efficiency
- Compressor Components: Impellers, Cylinders, Rotors, and Casings
- Equipment Selection: Matching Compressors to Process Needs
- Piping and Auxiliary Equipment: Intercoolers, Aftercoolers, and Knockout Drums
- Sizing and Selection of a Reciprocating Compressor
- Group Discussion: Challenges in Compressor Design

Day 3: Operations, Control, and Safety

- Compressor Controls: Surge Control, Anti-Surge Systems, and Load Sharing
- Operational Challenges: Start-Up, Shut-Down, and Load Variations
- Maintenance and Reliability of Gas Compression Systems
- Troubleshooting Common Operational Issues
- Safety Considerations: Overpressure Protection, Gas Leaks, and Fire Risks
- Case Study: Operational Challenges in High-Pressure Gas Compression

Day 4: Energy Efficiency and Environmental Considerations

- Energy Optimization in Gas Compression: Drivers and Power Requirements
- Waste Heat Recovery and Integration with Other Processes
- Environmental Standards: Emissions Control and Noise Reduction
- Economic Analysis: CAPEX and OPEX of Compressor Systems
- Regulatory Compliance in Gas Compression Systems
- Evaluating the Efficiency of a Compression System

Day 5: Advanced Topics and Emerging Technologies

- Advances in Compressor Technology: High-Speed Compressors and Magnetic Bearings
- Digital Tools: IoT, Automation, and Predictive Maintenance in Gas Compression
- Integration of Gas Compression with Processing Facilities and Pipelines
- Designing a Complete Gas Compression System for a Specific Scenario
- Course Wrap-Up, Assessment, and Certification

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NOTE:

Pre-& Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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