

TRAINING TITLE

SELECTION OF COMPRESSORS IN THE OIL AND GAS INDUSTRY

Training Duration

5 days

Training Venue and Dates

Ref. No. ME127	Selection of Compressors in the Oil and Gas Industry	5	14-18 Apr. 2025	\$5,500	DUBAI, UAE
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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

The Selection of Compressors in the Oil and Gas Industry Course is designed to provide professionals in the oil, gas, and petrochemical sectors with the fundamental knowledge and practical skills required to select, design, and operate compressors for various applications. Compressors play a crucial role in oil and gas operations, from gas transportation and processing to injection and pressure boosting.

TRAINING OBJECTIVES

By end of course participants will be able to understand

- **Understand Compressor Types and Principles:** Gain an understanding of different types of compressors (e.g., reciprocating, centrifugal, screw) and how they work.
- **Select the Right Compressor for the Application:** Learn how to assess the requirements of specific oil and gas applications and choose the appropriate compressor type, size, and configuration.
- **Analyze Operational and Design Considerations:** Understand key parameters such as pressure, flow rates, efficiency, and environmental factors affecting compressor selection.
- **Evaluate Performance and Efficiency:** Learn how to optimize compressor performance by analyzing capacity, energy consumption, and maintenance requirements.

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- Troubleshoot and Maintain Compressors: Develop troubleshooting skills and best practices for maintaining compressors, ensuring long-term reliability and operational efficiency.
- Address Safety and Environmental Concerns: Learn the safety implications of compressor operation and the environmental considerations, including emissions and noise control.

WHO SHOULD ATTEND?

- Mechanical engineers
- Process engineers
- Operations and maintenance engineers
- Project managers
- Equipment and plant operators
- Technicians responsible for compressor operation and maintenance
- Energy efficiency and sustainability professionals

COURSE PROGRAM

Day 1: Introduction to Compressors and Their Role in Oil & Gas

- **Overview of Compressors in Oil and Gas**
 - The role of compressors in oil and gas production, transportation, and processing
 - Importance of compressors for gas boosting, refrigeration, and injection
 - Types of compressors used in the oil and gas industry: reciprocating, centrifugal, screw, and others
- **Basic Compressor Principles**
 - Fundamental operating principles of compressors
 - Understanding pressure and volume relationships
 - Key compressor parameters: pressure ratio, volumetric flow rate, and power consumption
- **Types of Compressors**
 - Reciprocating compressors: design, applications, advantages, and limitations
 - Centrifugal compressors: principles, design considerations, and typical uses
 - Screw compressors: applications and performance characteristics
 - Comparison of various compressor types and selection criteria

Day 2: Key Considerations for Compressor Selection

- **Application Analysis**

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- Assessing the specific needs of the application: gas type, flow rate, pressure, and temperature
- Determining compressor type based on application (e.g., gas injection, gas transmission, air compression)
- **System Requirements**
 - Understanding system requirements and how they influence compressor selection
 - Key parameters: capacity, pressure, temperature, and efficiency
 - The impact of environmental and operational conditions (e.g., offshore vs onshore, temperature extremes)
- **Design Considerations**
 - Factors to consider when designing a compressor system: control systems, speed regulation, noise reduction
 - System integration: compressors in piping and system layout, including suction and discharge requirements
 - Pressure and flow regulation and compressor sizing tools

Day 3: Performance, Efficiency, and Energy Considerations

- **Compressor Performance Metrics**
 - Key performance indicators (KPIs): efficiency, power consumption, and capacity
 - How to calculate compressor performance: volumetric efficiency, isentropic efficiency, and thermodynamic cycles
 - Use of performance maps and compressor curves to evaluate capacity and efficiency
- **Energy Efficiency in Compressors**
 - Techniques to optimize compressor performance: energy-saving methods, operational practices
 - Assessing and improving compressor efficiency: variable speed drives (VSD), load/unload controls, and proper maintenance
 - Energy consumption in large-scale compressor systems and strategies for optimization
- **Understanding Compressor Power Requirements**
 - Calculating compressor power requirements based on specific operating conditions
 - Key calculations for compressors: brake horsepower (BHP), shaft power, and motor power requirements
 - Considerations for power supply and energy management in compressor operations

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Day 4: Troubleshooting, Maintenance, and Optimization

- **Compressor Troubleshooting**
 - Common issues: loss of capacity, vibrations, excessive power consumption, leaks, and noise
 - Identifying and diagnosing compressor faults: symptoms and causes of common compressor failures
 - Techniques for troubleshooting: pressure, temperature, and flow analysis
- **Preventive and Predictive Maintenance**
 - Maintenance best practices: routine inspections, lubrication, vibration monitoring, and cleaning
 - Use of condition monitoring tools: vibration sensors, temperature sensors, and online diagnostic systems
 - Preventing common failures through proper maintenance procedures
- **Optimization and Upgrades**
 - Optimizing compressor performance over time: improving capacity, reducing energy consumption, and extending lifespan
 - Retrofitting and upgrading older compressor systems for better performance
 - Integration of automation and control systems for enhanced operational efficiency

Day 5: Safety, Environmental, and Regulatory Considerations

- **Safety Considerations in Compressor Operations**
 - Health, safety, and environmental risks associated with compressor operations
 - Safety measures: pressure relief valves, over-speed protection, and safety shutdown systems
 - Safe handling of flammable, toxic, or corrosive gases and associated risks
- **Environmental Impact and Emissions Control**
 - Environmental regulations and standards: emissions control, noise abatement, and air quality
 - Techniques for reducing noise and vibration in compressors
 - Addressing compressor-related emissions: carbon emissions, methane leakage, and their environmental impact
- **Regulatory and Compliance Issues**
 - Overview of relevant industry codes and standards (e.g., ASME, API, ISO)
 - Ensuring compliance with local and international safety and environmental regulations
 - Managing compressor operations in compliance with environmental laws and industry standards

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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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