MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

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CENTRIFUGAL COMPRESSORS - OPERATION, MAINTENANCE, TROUBLESHOOTING & OVERHAUL

"Optimizing Compressor Performance through Advanced Operational Techniques, Maintenance, and Troubleshooting"

Schedule

Date	Venue	Fees (Face-to-Face)
19 - 23 Jul 2026	Doha – Qatar	USD 3495 per delegate
20 - 24 Sep 2026	Manama - Bahrain	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

Centrifugal compressors are crucial components in a wide range of industries, including oil and gas, chemical processing, power generation, and HVAC. Their reliability and efficiency directly affect the operational performance of plants and facilities. As such, ensuring the proper operation, maintenance, and troubleshooting of centrifugal compressors is vital to minimize downtime, reduce costs, and extend the lifespan of these critical machines.

This 5-day intensive course covers the fundamentals of centrifugal compressor operation, in-depth maintenance strategies, troubleshooting techniques, and methods for overhauling compressors. Participants will gain practical, hands-on knowledge to improve compressor performance, identify common failures, and execute effective repair strategies.

Objectives

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

- Understand the operating principles and components of centrifugal compressors
- Implement effective maintenance strategies to enhance compressor reliability and performance
- Diagnose and troubleshoot common compressor issues using systematic approaches
- Execute overhauls and repairs to restore compressors to peak performance
- Optimize compressor efficiency and prevent major mechanical failures through proper care and monitoring

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Why Attend

- Enhance your technical expertise in centrifugal compressor operation and maintenance
- Learn proven troubleshooting methods to quickly diagnose and address common issues
- Reduce compressor downtime and repair costs through preventative maintenance
- Gain hands-on experience in overhauling compressors and restoring full operational capacity
- Improve operational efficiency and safety by optimizing compressor performance

Target Audience

This program is designed for:

- Maintenance engineers and technicians working with centrifugal compressors
- Plant engineers and operations personnel responsible for compressor performance
- Reliability engineers and managers involved in compressor maintenance programs
- Technical staff in industries such as oil and gas, power generation, HVAC, and manufacturing
- Anyone looking to deepen their understanding of centrifugal compressors and their maintenance

Individual Benefits

Key competencies that will be developed include:

- Advanced understanding of centrifugal compressor mechanics and operations
- Skills in troubleshooting and fault diagnosis in compressors
- Hands-on experience with compressor overhaul processes
- Proficiency in implementing best practices for compressor maintenance and optimization
- Enhanced confidence in managing compressor-related challenges and improvements

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Reduced compressor downtime and improved asset reliability
- Enhanced ability to prevent compressor failures and costly repairs
- Increased operational efficiency and optimized performance of centrifugal compressors
- A more proactive and knowledgeable maintenance team
- Better alignment of maintenance strategies with operational and safety goals

Instructional Methodology

The course follows a blended learning approach combining theory with practical applications:

- Strategy Briefings – Theoretical foundations of centrifugal compressor operation and maintenance
- Case Studies – Real-world examples of compressor failures, troubleshooting, and repair
- Workshops – Hands-on exercises in compressor diagnostics, maintenance, and overhaul processes
- Peer Exchange – Group discussions on industry-specific challenges and solutions
- Tools – Troubleshooting checklists, maintenance schedules, and diagnostic tools

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Course Outline

DETAILED 5-DAY COURSE OUTLINE

Training Hours: 7:30 AM – 3:30 PM Daily Format: 3–4 Learning Modules | Coffee Breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Centrifugal Compressors and Basic Operation

- Module 1: Principles of Centrifugal Compression (07:30 – 09:30) • Operating principles of centrifugal compressors • Key components: impeller, diffuser, volute, bearings, and seals • Overview of compressor types and applications in various industries
- Module 2: Compressor System Design and Components (09:45 – 11:15) • Understanding the design and configuration of centrifugal compressors • Component selection, materials, and design considerations • Impeller dynamics, rotational speeds, and energy conversion
- Module 3: Operating Parameters and Performance (11:30 – 01:00) • Key performance indicators (KPIs) for centrifugal compressors • Operating curves: pressure, flow, power, and efficiency • Impact of operating conditions on compressor performance
- Workshop – Basic Compressor Setup and Operation (02:00 – 03:30) • Hands-on demonstration of compressor setup and monitoring parameters • Evaluating performance under different operational conditions

Day 2: Maintenance Strategies and Preventative Practices

- Module 1: Preventative Maintenance for Centrifugal Compressors (07:30 – 09:30) • Importance of scheduled maintenance and monitoring • Key maintenance tasks: lubrication, vibration monitoring, alignment, and cleanliness • Best practices for extending the lifespan of compressors
- Module 2: Common Maintenance Issues and Solutions (09:45 – 11:15) • Identifying and solving common compressor problems: leaks, bearing wear, vibrations • Monitoring for signs of mechanical stress and wear • Repairing common compressor issues during routine maintenance
- Module 3: Compressor Condition Monitoring Techniques (11:30 – 01:00) • Vibration analysis and acoustic monitoring • Temperature monitoring and pressure readings • Diagnostics using digital instruments and sensors
- Workshop – Preventative Maintenance Checklists and Techniques (02:00 – 03:30) • Create a customized maintenance schedule and checklist for centrifugal compressors • Hands-on practice with monitoring tools and maintenance diagnostics

Day 3: Troubleshooting Centrifugal Compressors

- Module 1: Troubleshooting Common Compressor Failures (07:30 – 09:30) • Systematic approach to troubleshooting compressor issues • Identifying mechanical, electrical, and performance problems • Analyzing root causes of failure and corrective actions
- Module 2: Using Diagnostic Tools for Effective Troubleshooting (09:45 – 11:15) • Utilizing vibration analysis, infrared thermography, and pressure transducers • Hands-on use of diagnostic instruments and troubleshooting techniques • Monitoring compressor startup and operational changes
- Module 3: Troubleshooting Case Studies (11:30 – 01:00) • Real-world examples of compressor failures and resolutions • Hands-on group analysis of malfunction scenarios
- Workshop – Troubleshooting Practice and Simulation (02:00 – 03:30) • Group troubleshooting exercise on a malfunctioning compressor • Develop a troubleshooting action plan based on real-time data

Day 4: Compressor Overhaul and Repair Techniques

- Module 1: Overhaul Procedures for Centrifugal Compressors (07:30 – 09:30) • Steps for disassembling, inspecting, and overhauling compressors • Replacing worn-out components and restoring performance • Safety protocols during compressor overhauls
- Module 2: Impeller, Shaft, and Bearing Maintenance (09:45 – 11:15) • Inspecting and replacing key components: impeller, bearings, seals • Techniques for cleaning, rebalancing, and refitting compressor parts • Aligning shafts and calibrating components
- Module 3: Compressor Reassembly and Testing (11:30 – 01:00) • Reassembling the compressor post-overhaul • Conducting functional tests and performance verification • Ensuring compressor efficiency and operational safety
- Workshop – Hands-on Compressor Overhaul and Testing (02:00 – 03:30) • Disassemble and reassemble a centrifugal compressor as part of a practical exercise • Test operational performance after completion

Day 5: Optimization and Performance Monitoring

- Module 1: Performance Optimization of Centrifugal Compressors (07:30 – 09:30) • Maximizing efficiency through optimal operational settings • Identifying performance bottlenecks and optimizing performance • Adjusting parameters for improved flow and pressure control
- Module 2: Energy Efficiency and Sustainability (09:45 – 11:15) • Techniques for reducing energy consumption in centrifugal compressors • Understanding the environmental impact of compressor operations • Implementing energy-saving measures and monitoring systems
- Module 3: Future Trends and Technologies in Compressor Design (11:30 – 01:00) • Innovations in centrifugal compressor technology: smart monitoring, AI, and IoT • Predictive maintenance and automated diagnostics • The future of sustainable compressor technologies
- Final Workshop – Performance Optimization Plan (02:00 – 03:30) • Develop an optimization plan for a centrifugal compressor installation • Group discussion and course wrap-up

Certification

Participants will receive a Certificate of Completion in Centrifugal Compressors – Operation, Maintenance, Troubleshooting & Overhaul, validating their ability to operate, maintain, troubleshoot, and overhaul centrifugal compressors for optimal performance.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**