

Centrifugal Compressors: Principles to Practice

Training Course **Centrifugal Compressors: Principles to Practice**

Course Language **English**

Course Duration Total Number of hours: 21 Hours

Course Objectives: The course objective is to provide “Centrifugal Compressor” training to engineers and technicians with the following topics

Course Key Topic Area Includes:

1. Compressor Introduction

Compression Methods and Consideration in Compressors Selection

2. Principles of Centrifugal Compressors

Centrifugal Compressor Design and Construction and components

3. Compressor Arrangements and Control

Auxiliary Systems and Centrifugal Compressor Performance & Control

Surge line and Stone line

4. Compressor Operation

The compressor permissive to start and Purge cycle

The anti surge control valve position, Normal start up and shut down

5. Maintenance and Troubleshooting

Preventive and predictive maintenance and Principles of troubleshooting

Lubrication and Seals systems and Condition monitoring systems

Course Content

At the end of the program the trainees will be able to:

- Learn how different design parameters affect compressor’s performance and operation
- Learn about the different categories of gas compressors and their applications
- Deepen the understanding of the limits of the compressor operation
- Read and calculate the performance curves of compressor
- Learn the control and protection systems of centrifugal compressor systems
- Learn the start and shut down of the compressor properly
- Learn the latest techniques to compressor condition monitoring
- Acquire the proactive techniques like alignment, balancing, Vibration and oil analysis
- Pick up methods of troubleshooting and maintaining

Learning Outcomes

- **Mechanical/Rotating Equipment Engineers** – responsible for selection, sizing, and troubleshooting compressors
- **Process Engineers** – who design and optimize systems involving compressors
- **Maintenance Engineers/Technicians** – who service, overhaul, and repair compressor units
- **Operations Engineers/Plant Operators** – who run compressors day-to-day and need to understand operating limits and behavior
- **Reliability Engineers** – focused on failure analysis, condition monitoring, and uptime

Target Audience

Course Material /Technology used/ Details Relevant to the course.

Course Materials

- Presentation Slides (PDF/PPT) – provided digitally or in print for note-taking
- Compressor Performance Curves & Datasheets
- Case Studies & Failure Reports –surge events, seal failures, bearing damage,
- Post-Course Assessment/Quiz – to reinforce and validate learning outcomes

Technology/Tools Used

- 3D Models/Animations – of compressor internals (impellers, seals, bearings)
- Virtual/Interactive Compressor Cutaways – showing rotor-stator assembly,
- Video Demonstrations –start-up sequences, surge phenomena, vibration
- Control System Screenshots/Simulators – anti-surge control
- Vibration Analysis Tools/Data Samples – for condition monitoring

Instructor Details & Brief Instructor Bio

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