

# Reciprocating Equipment Analysis

## Course Objectives:

This course gives an introduction to the Plant Condition Monitoring techniques and procedures. MCM course gives basic understanding of the common practices involved in machine health management. MCM course is a combination of theoretical condition monitoring strategies backed up by experimental support. It discusses in detail about the common maintenance issues in process industries, failure mechanisms and modes, along with fault-specific corrective technique. It also provides clear understanding of common MCM techniques used in fault detection e.g. Electric Motor Analysis, Oil Analysis/Tribology, Infrared Thermography, Visual and Optical Testing, Ultrasonic Testing etc. In addition to this, MCM course gives basic concepts of VA techniques used in plant condition monitoring. This three-day course would be conducted by the qualified & experienced engineers. The value of MCM training course extends beyond the classroom and focusses on professional development related to solving real world problems in machine maintenance. The course provides unique opportunities of understanding MCM principles, theories and techniques. In addition, the training course offers practical knowledge in the complex field of machine condition monitoring

## Detailed topic list:

### Technology

- ✚ Construction and design philosophies.
- ✚ Components of reciprocating compressors
- ✚ Auxiliary systems
- ✚ Safety devices.

### Performances

- ✚ Ideal gas compression
- ✚ Actual compression
- ✚ Indicator diagram.
- ✚ Efficiency, compression power.
- ✚ Case studies

### Compressor Process Operation

- ✚ Start-up, shutdown. Performances control.
- ✚ Influence of compression ratio
- ✚ Gas composition and suction temperature.
- ✚ Multistage compressors.
- ✚ Case study: air compression.

### Maintenance & Troubleshooting

- ✚ Noise, vibration and temperature.
- ✚ Typical defects and failures on valves, piston rings and packing, piston rod...
- ✚ Dismantling and assembly procedures
- ✚ Reports Writing.
- ✚ Safety devices and prevention.
- ✚ Case studies: typical failures on reciprocating compressors.

### Dynamic Simulation & Applications

- ✚ Use of a dynamic simulator.

- ✚ Exercises on start-up and shutdown phases.
- ✚ Applications using disturbances generated by the lecturer

### Course Duration

- The course consists of Two full days of training & 1-hour exam

### Hours

- 9.00 am to 4.00 pm (Days 1-2)
- Exam: 1 hour - end of Day 2

### Who should attend

- ☞ Maintenance Professionals
- ☞ Plant/Rigs Supervisors
- ☞ R & D Personnel
- ☞ QA/QC Supervisors
- ☞ Equipment designers
- ☞ HVAC Engineers
- ☞ Plant Technicians
- ☞ Vibration Engineer
- ☞ Inst. Technicians
- ☞ Maintenance Technicians
- ☞ Equipment Operators
- ☞ Reliability Engineers
- ☞ Industrial Engineers
- ☞ Operations Managers

### Learning Objectives

Upon completion of the course, participants will be able to:

*List the different parts of a compressor and explain*



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*their characteristics, explain the evolution of compressor operating parameters, implement appropriate monitoring for each type of compressor, be involved in troubleshooting activities*



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