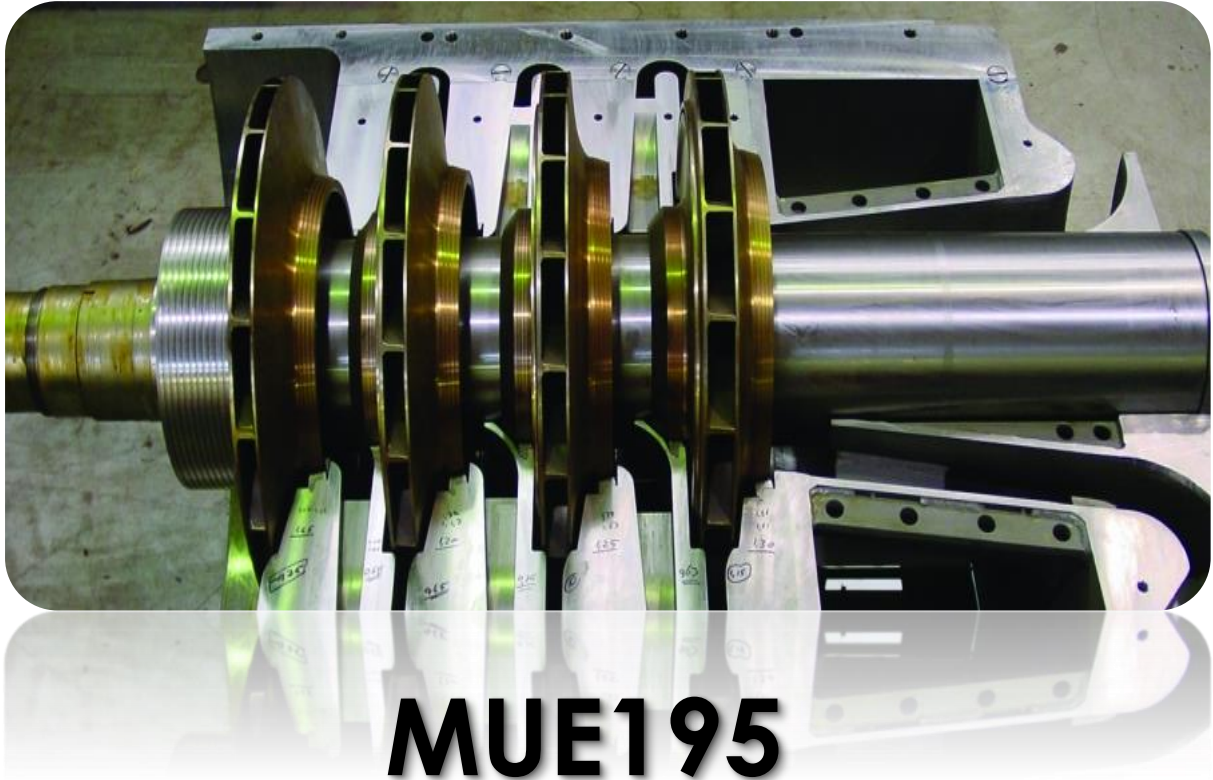




MUE195

Centrifugal Gas Compressor Operation and Control

Course Introduction:

Centrifugal Compressors are types of dynamic compressors; that is they compress by imparting (giving) velocity energy to the gas. A Centrifugal compressor takes mechanical energy from a driver such as an electric motor via a drive shaft.

For anyone responsible for installing, servicing, or operating Centrifugal and Reciprocating compressors, this course discusses the theory of operation and explains how to install, troubleshoot, overhaul, and repair all types of compressors. This comprehensive course offers practical details on how to install, service, operate, and maintain compressors used in any of the process industries such as pulp and paper, mining, food processing, pharmaceuticals.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Identify the relevant codes, standards and industry guides
- ✓ Describe the process of material selection and properties
- ✓ Describe the process of selection and sizing pipe and fittings
- ✓ Explain the maintenance inspection techniques
- ✓ Identify methods for hydrostatic and leak testing
- ✓ Describe the process of classification and evaluation of corrosion
- ✓ Explain the evaluation of crack flaws and mechanical damage

Who Should Attend?

This course is designed for plant and maintenance engineers, maintenance managers and supervisors and compressor specialists. It should be valuable to senior maintenance mechanics and those who are involved with compressors, their operation, and their maintenance.

Course Outline:

Day 1:

Compressor Types

- Centrifugal
- Axial
- Helical screw
- Reciprocating

- Application ranges
- Short-cut selection methods

Mechanical Design of Centrifugal Compressors

- Casings
- Compressor rotors
- Impellers
- Diaphragms
- Side Streams
- Bearings
- Liquid film and gas seals
- Lube and seal oil systems
- Gas seal support system

Centrifugal Compressor Components and Operation

- Centrifugal compressor characteristics
- Horizontally split compressor components
- Vertically split compressor components; centrifugal compressor operation

Day 2:

Protective Systems and Practices

- Lubrication System Components
- Lubrication System Operation
- Surge Control
- Variable-pressure surge control system components
- Variable-pressure surge control system operation
- Constant-pressure surge control system components
- Constant-pressure surge control system operation
- Blow off recirculation
- Compressor Maintenance

Protective Systems and Practices (cont'd)

- General considerations
- Air filter maintenance
- Oil filter maintenance

Day 3:

Centrifugal Compressor Maintenance

- Overview of alignment methods

- Predictive versus preventive strategies
- Run-length extension surveys
- Machinery turnaround planning

Mechanical Design of Reciprocating Compressors

- The Compression cycle
- Cylinders
- Valves
- Pistons and rods
- Rod packing
- Crankcase and frame attachments
- Foundations and piping
- Capacity control

Day 4:

Reciprocating Compressor Operation

- Lubrication systems
- Valves, valve problems and rebuilding
- Packaging and packing problems
- Controls and cooling systems

Saving Compressor Air Cost While Increasing Efficiency

- The impact of artificial demand
- Today's compressor controls
- Realistic leak management
- Stabilizing a compressed air system
- Compressed air dryers

Day 5:

Overhaul and Repair of Reciprocating Compressors

- Methods of repair and overhaul
- Alignment and piston rod run out
- Foundation problems and repair
- Component repair and rebuilding

Troubleshooting Compressor Problems

- Basic approaches to compressor troubleshooting
- Typical problems and solutions
- Diagnostic tests

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session