

**TRAINING TITLE**

**GAS COMPRESSORS: SELECTION AND DESIGN**

**Training Duration**

**5 days**

**Training Venue and Dates**

|              |  |          |                        |                |                   |
|--------------|--|----------|------------------------|----------------|-------------------|
| <b>ME113</b> | <b>Gas Compressors: Selection and Design</b> | <b>5</b> | <b>20-24 Jan. 2025</b> | <b>\$5,500</b> | <b>Dubai, UAE</b> |
|--------------|--|----------|------------------------|----------------|-------------------|

**In any of the 4 or 5-star hotels. The exact venue will be informed later.**

**Training Fees**

- **\$5,550 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**

This course is to provide the trainees with a strong background in the field of compressors structures, types and maintenance as well as the compressor troubleshooting. The emphasis is placed on understanding the maintenance of the different types of compressors and the different methods of bearing, sealing and lubricating systems, and axial thrust prevention methods.

Centrifugal Compressors play a very essential role in many petrochemical and industrial plants. Centrifugal compressors in general run at very high speeds, exposed to high temperature. The compressor operation is confined between the Surge and Stonewall limits.

The compressor performance also is affected by the variation in operating conditions. Elevated temperature and large centrifugal stresses make the gas turbine operating under very critical conditions requires very complicated monitoring and protection systems. The above very severe operating conditions enhance the machines deterioration. Accurate instrumentation, monitoring, troubleshooting and maintenance programs are essential for maintaining and increasing the available time of the machines. Understanding and learning Centrifugal compressors more deeply help smooth and free trouble operation.

During the course the design, performance, operation limits and control system are going to be addressed thoroughly. Parameters affecting the above will also be discussed during the course.

DMCT/OL/9/18(Rev3Dt:23/9/18)

## TRAINING OBJECTIVES

### By end of course participants will be able to understand

- Familiarize participant of different compressors design.
- Learn how different design parameter affects the machines performance and operation.
- Familiarize participant of the different types of gas compressors and their application
- To deepen the participants understanding of the limits of the compressor operation.
- Enable participants to read and calculate the performance curves of compressor
- To familiarize the participant with control, and protection systems of centrifugal compressor systems.
- To familiarize the participant to start and shut down the compressor in smooth and properly methods.

## WHO SHOULD ATTEND?

Maintenance, Process and Mechanical engineers & technicians are involved with types, maintenance, construction, and troubleshooting, of Compressors. Entry level engineers, technicians all the way to senior level will benefit because of the course structure.

## TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

## COURSE PROGRAM

### **FLUID MECHANIC & THERMODYNAMICS PRINCIPLES:**

- ✚ Types of fluids
- ✚ Fluid properties
- ✚ Fluid machines (Turbomachinery of which the compressors)

### **INTRODUCTION TO COMPRESSOR TYPES:**

1. Positive displacement compressors
2. Dynamic compressors

*DMCT/OL/9/18(Rev3Dt:23/9/18)*

**POSITIVE DISPLACEMENT COMPRESSORS:**

- I. Reciprocating Compressors**
  - 1. Piston Compressors
  - 2. Plunger Compressors
  - 3. Diaphragm Compressors

**MAINTENANCE OF RECIPROCATING POSITIVE DISPLACEMENT COMPRESSORS**

**POSITIVE DISPLACEMENT COMPRESSORS:**

- II. Rotating Compressors**
  - 1. Gear Compressors
  - 2. Lobe Compressors
  - 3. Screw Compressors
  - 4. Sliding vanes Compressors

**MAINTENANCE OF ROTATING POSITIVE DISPLACEMENT COMPRESSORS**

**DYNAMIC COMPRESSORS**

- 1. Centrifugal (Radial-flow) Compressors
- 2. Axial-flow Compressors
- 3. Ranges of Application and Limitations

**MAINTENANCE OF ROTATING POSITIVE DISPLACEMENT COMPRESSORS**

**MECHANICAL DESIGN OF CENTRIFUGAL COMPRESSORS:**

- 1. Types of impellers
- 2. Types of casings

**MECHANICAL DESIGN OF CENTRIFUGAL COMPRESSORS (CONTINUED):**

- 3. Through-flow Compressors
- 4. Side Streams Compressors
- 5. Reverse arrangement Compressors
- 6. Inter-cooled Compressor

**MECHANICAL DESIGN OF CENTRIFUGAL COMPRESSORS (CONTINUED):**

- 7. Compressors bearings
- 8. Compressors couplings

DMCT/OL/9/18(Rev3Dt:23/9/18)

**BASIC COMPRESSOR PERFORMANCE & PARAMETERS:**

1. Thermodynamics of a Compressor
2. Compressor Capacity
3. Compressor Power
4. Compressor Efficiencies

**AXIAL AND RADIAL THRUST:**

1. Axial thrust
2. Cause of axial thrust
3. Different methods used to eliminate axial thrust
4. Radial thrust
5. Cause of radial thrust

**Effect of radial thrust**

**PARALLEL & SERIES COMPRESSOR OPERATION:**

1. Parallel operation
2. Series operation

**LUBRICATION & SEALING SYSTEMS:**

1. Lubrication
2. Sealing methods

**SURGE IN CENTRIFUGAL COMPRESSORS:**

1. What is surge
2. Surge danger
3. Method of controlling surge

**PRIME MOVERS:**

1. Different types of prime movers
2. Prime movers configuration
3. Prime movers operation

**COMPRESSOR MAINTENANCE & TROUBLESHOOTING:**

1. Maintenance of compressors
2. Troubleshooting

**NOTE:**

Pre-& Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

.....  
DMCT/OL/9/18(Rev3Dt:23/9/18)