Training Title

CENTRIFUGAL COMPRESSORS & STEAM TURBINES

Training Duration

5 days

Training Dates & Venue

REF ME031	Centrifugal Compressors & Steam Turbines	5	07-11 Apr 2025	$5,500	Abu Dhabi, UAE

In any of the 4 or 5-star hotel. Exact venue will be informed soon.

Training Fees

- **$5,500 per participant for Public Training including Course Materials/Handouts, Tea/Coffee, Refreshments & Lunch**

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING OVERVIEW

TRAINING INTRODUCTION

This seminar entails a study of gas compression and expansion laws applied to industrial processes followed by an illustration of the different types of rotating machines usually encountered in plants, and their related aspects. The aim is to provide a satisfactory approach to the problems posed by compressors and turbines and the means to solve them.

Key Highlights of the course are:

- **Understanding of monitoring techniques as applied to compressors and turbines.**
- **Ability to put in place measures to quantify equipment condition.**
- **Interface with and control service providers.**
- **Identify and specify new compressor and turbine plant.**

TRAINING OBJECTIVES

At the end of this seminar participants will have:

- **An understanding of the construction and operational constraints of centrifugal compressors and steam turbines.**
- **Knowledge of how to optimally maintain the equipment for the benefit of the company.**
- **Hints and Tips for practical application of monitoring technologies so as to achieve the best results.**

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WHO SHOULD ATTEND?

- Engineers, Operators, and Technicians in Maintenance, Engineering and Production.
- Anyone who wishes to update themselves on Maintenance Engineering Technologies, judge the suitability of these technologies for their needs, and learn how to implement them for the benefit of their organizations.

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 the multiple-choice type will be made available on a 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 DAILY CONTENTS:

Day 1:

COMPRESSORS

Introduction to Compressor Types:

- Centrifugal; Axial; Reciprocating; Helical Screw; Ranges of Application and Limitations

Positive displacement compressors

- Reciprocating; Rotating;

Mechanical Design of Centrifugal Compressors:

- Compressor Side Streams, Rotors, Balancing, Rotor Dynamics, Impellers, Casings

Mechanical Design of Centrifugal Compressors (continued):

- Bearings, Seals, Couplings, Controls

Day 2:

Basic Compressor Parameters:

- Thermodynamics; Capacity; Power; Efficiencies; Gas Properties; Intercooling

Axial and Radial Thrust:

- Axial thrust and methods of balance
- Radial thrust and its effect

Selection of Centrifugal Process Compressors:

- Calculation Methods, Characteristic Curves; Stability

Surge in Centrifugal Compressors

- Method of controlling surge
- Lubrication and sealing systems:

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Day 3:

Compressor Inspection, Maintenance:

STEAM TURBINES

Steam generation

- **Energy, matter and fuel**

Boilers:

- **Sensible and latent heat, superheating**

Steam Turbines

- **Operating Principles, Impulse Turbines, Reaction Turbines**

Steam Turbines (Continued):

- **Application Ranges, Configurations, Application Constraints**

Turbine Components:

- **Turbine Rotors, Blading, Diaphragms, Nozzles, Steam Chests, Glands and Gland Systems, Bearings**

Day 4:

Turbine Components (Continued):

- **Balancing, Rotor Dynamics, Governing Systems, Lube Oil Management**

Overview of Selection and Sizing of Steam Turbines for Reliability:

- **Thermodynamics, Steam (Water) Rates, Condensing and Backpressure Turbines, Single and Multistage Types, Process Considerations**

Operation and Maintenance of Steam Turbines:

- **Commissioning, Startup, Run-In and Shut-down and Surveillance**

Operation and Maintenance of Steam Turbines (Continued):

- **Steam Turbine Inspection, Maintenance, Overhaul and Repair**

Day 5:

Cycles:

- **Carnot cycle, regenerative cycle, Brayton**

Predictive vs. Preventive Maintenance Techniques:

- **Determination of Which Method to Use**

Machinery Reliability Audits and Reviews:

- **Overview; Reliability Impact on Plants**
- **Written Test (Optional)**

Note:

Pre & Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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