Training Title

PUMPS AND COMPRESSORS: DESIGN, OPERATION, MAINTENANCE AND TROUBLESHOOTING

Training Duration

5 days

Training Duration & Venue

REF ME033	Pumps & Compressors- Design, Operation, Maintenance & Troubleshooting	5	16 – 20 June 2025	$5,500	Dubai, UAE

Training will be held at any 4 or 5-Star Hotel. The exact venue will be informed later

Training Fees

- **$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch**

Training Certificate

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

TRAINING DESCRIPTION:

Pumps and compressors find extensive use in petrochemical process plants, water circulation systems, A/C and heating systems, and many other applications. Keeping these machines running with the least troubles and shutdown decreases the downtime of the whole system. Right machine selection appropriate to the right application, right machine operation, effective maintenance programs, reliable monitoring system, and skilled personnel capable of doing the right troubleshooting are essential requirements for prolonging machine life. All the above can be achieved via a deeper understanding of the machine's construction and tolerances, the limits and constraints on their operation, and the more effective controlling methods.

This course will offer the opportunity to learn more about pumps and compressors, their design, construction, operation, performance curves, control troubleshooting, and maintenance. During the course, participant's discussion, comments, and bringing up their problems are welcomed and encouraged. Short tests on the course material will be performed to examine the degree of delivering the right quality of the presented material.

TRAINING OBJECTIVES

- **Review the basics of Pumps and Compressors**

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- **Learn how the performance curves of Pumps and Compressors are measured and calculated**
- **Use the similarity laws to calculate the Pumps/Compressors' performance at different speeds and rotor size**
- **Learn methods of troubleshooting and maintaining Pumps/ Compressors**
- **Highlight the importance of the related international codes and standards**

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 questions and to share in the development of the right answers using your analysis and experiences. Tests of multiple-choice type will be made available daily to examine the effectiveness of delivering the course.

All presentations are made in excellent colorful PowerPoint. Very useful Course Materials will be given.

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

WHO SHOULD ATTEND

Supervisors, Engineers & Facility/Utility engineers, Technicians, Operating Personnel, or anyone who requires a working level of knowledge of pumps & compressors.

Competencies Emphasized

- **Deepen the understanding of the function of different types of pumps and compressors**
- **Understanding the characteristics of pumps and compressors**
- **Learning how to read and use the performance curves of Pumps and Compressors.**
- **Understand the limits of operation of pumps and compressors**
- **Learn more about cavitation in pumps and surge in compressors and methods of avoiding these vital problems**
- **Ability to carry out troubleshooting of pumps and compressors and learn methods of curing different types of problems**

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COURSE OUTLINE

Day 1: Fundamentals of Pumps and Compressors

- **Introduction to Fluid Mechanics**
  - Basic principles of fluid dynamics
  - Overview of liquids vs. gases
- **Types of Pumps**
  - Centrifugal and positive displacement pumps
  - Specialty pumps and their applications

Day 2: Pump Design and Operation

- **Pump Design Principles**
  - Hydraulic design and material selection
- **Operating Characteristics**
  - Pump curves, efficiency, and head calculations

Day 3: Compressors: Types and Operation

- **Introduction to Compressors**
  - Positive displacement vs. dynamic compressors
- **Compressor Design and Thermodynamics**
  - Key design considerations and performance metrics

Day 4: Maintenance and Troubleshooting

- **Maintenance Strategies**
  - Predictive vs. preventive maintenance techniques
- **Troubleshooting Common Issues**
  - Pumps: cavitation, leakage, vibration
  - Compressors: overheating, pressure problems, noise

Day 5: Practical Applications and Review

- **Case Studies**
  - Real-world applications and lessons learned
- **Hands-On Troubleshooting and Review**
  - Practical exercises and final assessment
  - Q&A session to clarify concepts

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NOTE:

Pre & Post Tests will be conducted

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

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