

Training Course

**PREVENTIVE & PREDICTIVE MAINTENANCE OF ROTATING EQUIPMENT**

Training Duration

**5 Days**

Training Venue and Dates

REF ME058	Preventive & Predictive Maintenance of Rotating Equipment	5	08-12 June 2020	\$ 6,250	Larnaca, Cyprus
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In any of the 5 star hotel. Exact venue will be informed once confirmed.

Training Fees

- 6,250 US\$ per participant for Public Training including Course Materials/Handouts, Tea/Coffee, Refreshments & International Buffet Lunch

Training Certificate

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

TRAINING INTRODUCTION

This is a five-day course on Rotary Machinery Preventive and Predictive Maintenance. Different maintenance strategies will be discussed; elements of each maintenance strategy, their advantages and disadvantages will be explored. The selection of the appropriate strategy that fit the mode of failure and results in the minimum time between repair and that leads to least down time and maintenance cost is one of the maintenance engineer duty that must be mastered. Tools and measurements involved in each maintenance strategy must also be recognized and deeply understood. To apply the above techniques effectively on the Rotary Machinery, one should be aware of their failure modes, and methods of troubleshooting. The above will applied on different type of Rotary Machinery like pumps, compressors, and Turbines.

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WHO SHOULD ATTEND:

Engineers, technicians and managers responsible for selection, installation, machinery failure analysis, troubleshooting and maintenance of different rotary machines like pumps, compressors, fans, blowers, steam turbines, gas turbines will benefit from this course.

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 motivate everybody find the right answers.

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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 CONTENTS:

The following topics will be covered in the course over five working days

#### Ch 1 Maintenance Strategies

Maintenance Strategies

Corrective Maintenance

Breakdown Maintenance

Preventive Maintenance

Predictive Maintenance

Corrective Maintenance

Effective Preventive Maintenance

    Planning & Scheduling

    Mode of Failures

    Coordination with Production

    Opportunity Preventive Maintenance Activities

Predictive Maintenance Techniques

    Vibration monitoring

    Thermography

    Tribology

    Visual inspections

    Ultrasonics

    Process Parameters

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#### Ch 2 Causes of Machinery Failure

Improper Specifications

Improper Sizing

    Material Deterioration

    Overstressing

    Material Corrosion

    Overheating

    Fatigue Failure

    Brittlement Failure

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Misalignment  
Cold versus Hot Alignment  
Alignment Tolerances  
Imbalance  
Causes of Imbalance  
Level of Balancing  
Vibration due to Imbalance  
Off-design Operation  
Range of Acceptable Operation  
Limits of Operation  
Controlling Systems  
Loop Oil Systems  
Bearings  
Seals  
Control Systems  
Installation Problems  
Piping Stresses

**Ch 3 Root Cause and Troubleshooting**

Failure Consequences  
Failure Modes  
Age-related Failure  
Failure which are not age-related  
    The Failure Process  
The Six Failure Patterns  
Technical History Data  
Failure Finding Task

**Ch 4 Failure Prevention**

Proper Specifications  
Codes and Standards  
Proper Operation  
Protective and Safety Devices  
Proper Training  
    Monitoring Systems  
Maintenance Planning

**Ch 5 Applications and Case Studies**

Pumps  
Fans and Blowers  
Compressors

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Steam Turbines  
Gas Turbines

**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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