Training Course

PREVENTIVE & PREDICTIVE MAINTENANCE OF ROTATING EQUIPMENTS

Training Duration

5 Days

Training Venue and Dates

REF RM025	Preventive & Predictive Maintenance of Rotating Equipments	5	17-21 June	$ 5,000	Larnaca, Cyprus

In any of the 5 star hotel. Exact venue will be informed once confirmed.

Training Fees

- **5,000 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.

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.

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. 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**
- **Themography**
- **Tribology**
- **Visual inspections**
- **Ultrasonics**
- **Process Parameters**

Ch 2 Causes of Machinery Failure

Improper Specifications
Improper Sizing
- **Material Deterioration**
- **Overstressing**
- **Material Corrosion**
- **Overheating**
- **Fatigue Failure**
- **Brittlement Failure**
- **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
Steam Turbines
Gas Turbines

Discussions and Last Day Assessments will be carried out.

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