

Training Title:

ADVANCED MACHINERY FAILURE ANALYSIS, PREDICTIVE MAINTENANCE & PROBLEM SOLVING

Training Duration:

5 Days

Training Venue and Dates

RM015	Advanced Machinery Failure Analysis, Predictive Maintenance & Problem solving	5	05-09 Aug 2024	\$6,000	Kuala Lumpur, Malaysia
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In any of the 4 or 5-star hotels. The exact venue will be informed soon.

Training Fees

- \$6,000 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 DESCRIPTION

The course presents an understanding of equipment failure characteristics. To achieve an optimal maintenance program that meets specified safety, environmental, and economic goals. Participants will learn to preserve equipment functions by identifying appropriate predictive maintenance (Pd.M.) tasks, failure-finding tasks, and other actions that protect against failure or mitigate the consequences of failure

This course presents a systematic approach to fault diagnosis and failure prevention in a broad range of machinery used in many industries. The key routes to preventive maintenance are demonstrated through both overview and the study of examples in different failure analyses and a sequential approach to machinery troubleshooting and problem-solving

Failure analysis, Troubleshooting, and Predictive & Planned Maintenance techniques, including vibration analysis, oil analysis, and other techniques are discussed in the course to optimize the maintenance engineering effort while maximizing production

This course provides the fundamentals of Pd.M. and condition monitoring applicable to plants, facilities, and manufacturing lines. Predictive Maintenance & Condition Monitoring will provide Participants with a framework to make the right decisions on what equipment needs condition monitoring, what technologies to use to meet their needs, and how to measure the effectiveness of their decisions

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TRAINING OBJECTIVES

Participants will learn how to collect, analyze and interpret failure statistics and will also gain an understanding of FMECA.

Participants will be instructed in condition monitoring methods and will be taught how vibration analysis can be used to detect, locate, severity assess and diagnose a range of common faults in machines

Upon the successful completion of this course, the participant shall be able to:

- understand the principles of failure analysis in process plant
- An understanding of Machine Failure Analysis and Troubleshooting techniques
- learn about machinery troubleshooting in pumps, centrifugal compressors, gas turbines, and electric motors
- Describe the Benefits of a PdM & Condition Monitoring Program
- Identify What Equipment to Monitor
- Predict What Maintenance Needs to be Done and When
- An understanding of a range of Planned & Predictive Maintenance Technologies
- Knowledge of the potential contribution of each of these technologies to maintenance efficiency
- Guidelines indicating how these technologies can interact with and support each other

WHO SHOULD ATTEND?

This seminar is directed toward Supervisors, Team Leaders, and Managers in Maintenance, Engineering, and Production. The seminar will also benefit anyone who wishes to update themselves on Predictive Maintenance Technologies and Failure Analysis techniques, as well as those who have to 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 motivate everybody to find the right answers. The delegates will also be encouraged to raise their questions and to share in the development of the right answers using their analysis and experiences.

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

DAILY COURSE OUTLINE

DAY 1

Failure Analysis techniques

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Equipment failure
Six patterns of the component failure rate over the life
Controlling introduced failure
Failure rate bathtub curve
Where to start: equipment criticality or risk

Failure analysis tools
Failure Mode & Effects Analysis
Reliability Centered Maintenance
Computer Maintenance Management Systems
Failure analysis - closing the loop
Root cause failure analysis (RCFA)
Building a system for equipment condition indicating

- Equipment data
- Failure data
- Maintenance data
- Data format

DAY 2

Failure and maintenance notations
Failure descriptors
Failure causes
Method of detection
Maintenance activity
Data requirements for various applications
Electrical motor
Gas turbines
Pumps
Compressors

DAY 3

The Basic Concept of Predictive Maintenance
The Top 6 Benefits of Predictive Maintenance
Establishing a Predictive Maintenance Program
Goals, objectives, and benefits
Functional requirements
Selling predictive maintenance programs
Selecting a predictive maintenance System
Database development
Getting started
The optimum predictive maintenance Program
How to Choose the Right Pd.M. Technologies
Four Reasons Why Pd.M. Doesn't Work

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**Are You Collecting The Right Data?
World-Class Maintenance**

DAY 4

Predictive Maintenance – Pd.M.

Scheduled predictive

Predictive Technologies

Condition Monitoring Technologies

Vibration Analysis

General Analysis Method

IR Thermography

Ultrasonic Leak Detection

Oil and Wear Particle Analysis

Oil Analysis

Motor Circuit

Surface Flaw Detection

Liquid Penetration

Magnetic Particle

Sub-Surface Flaw Detection

Ultrasonic Thickness (Auto/Manual)

Eddy Current

Radiography

Endoscope (Borescope) inspection

DAY 5

Vibration analysis

Introduction

Data acquisition

Data interpretation

Vibration due to plane (journal) bearings

Vibration due to resonance

Turbomachinery problems

Vibration problems with specific machinery types

Gearbox vibration

Condition Monitoring

Condition Monitoring

The machine life cycle

Standards Organizations

List of BS/ ISO condition monitoring standard

BS ISO 17359

Computer application in machine condition monitoring

Note:

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Pre & Post Tests will be conducted.

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



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