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Course Name

Machine Failure Analysis and Prevention

Sector Name

Mechanical Engineering

Document Type

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Machine Failure Analysis and Prevention

Course Introduction

This training program is designed to convey the latest thinking and best practice of all Equipment related to Industry Equipment Components, Operation, and Troubleshooting conditions, Monitoring, and Analysis via Lectures, Case Studies, and Program activities. Also, it gives a detailed, advanced treatment of the detection, location, and diagnosis of faults in Mechanical equipment.

Case studies and examples are used throughout the program to emphasize key points and to underline the relevance and applicability of the topics being addressed. It will provide a solid foundation for technologists moving into a machine monitoring and diagnostic role.

All delegates will learn the technique, tools, and procedure of root cause failure analysis and failure mode and effects analysis as a proactive strategy for achieving precise operation and improving machinery performance.

This course offers insight into how to analyze a system’s failure modes and define how to prevent or find those failures early.

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Target Audience

- ✓ Reliability & Maintenance Engineers – Diagnosing failures and implementing preventive strategies.
- ✓ Mechanical & Design Engineers – Enhancing system durability and performance.
- ✓ Plant Operators & Technicians – Identifying early warning signs of failure.
- ✓ Quality & Asset Management Specialists – Reducing downtime and optimizing lifecycle costs.

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Learning Objectives

- ✓ Master understanding of the Terminology used in measuring and analysis.
- ✓ Understand how to improve equipment through the prediction and avoidance of Equipment Failure.
- ✓ Understand the critical necessities and priorities associated with maintaining machinery.
- ✓ Identify the Key procedure for the implementation of risk-based failure analysis.
- ✓ Master reducing the overall life cycle cost of owning a piece of equipment.
- ✓ Maximize component life by avoiding the cause of failure.
- ✓ Master implementing real improvements in machinery reliability and plant performance.

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Course Outline

✓ 01 DAY ONE

Understanding Failure Analysis:

- ✓ Introduction to Failure Analysis and Troubleshooting Systems.
- ✓ What are the Causes of Machinery Failure?
- ✓ What are the mechanical Design Properties?
- ✓ Understanding Equipment Failure: “Case Studies”.
- ✓ What are the effects of Failure?
- ✓ Cascading Failure.
- ✓ Understand Failure Modes.
- ✓ Chronic vs. Sporadic Failures.
- ✓ Overview of Failure Reduction Programs
- ✓ Failure reporting techniques.

Understating Root Cause Failure Analysis Process:

- ✓ RCFA: Definition and Objectives.
- ✓ Identify the types of Root Causes.
- ✓ What are the seven Generic Steps in an RCFA?
- ✓ What are the Challenges that may face you in setting up RCFA?
- ✓ How to Sustain an RCFA Process?
- ✓ Case Studies.
- ✓ Practical Application.

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Course Outline

✓ 02 DAY TWO

Failure Analysis & Investigation Tools

- ✓ Brainstorming.
- ✓ Flow Charts.
- ✓ Histograms.
- ✓ Fishbone Diagrams.
- ✓ Pareto Charts.
- ✓ Fault Tree Analysis.
- ✓ Failure Mode and Effect Analysis (FMEA).
- ✓ Practical Application “Exercises”.

Failure Mode and Effect Analysis (FMEA)

- ✓ Failure Analysis Methods
- ✓ Common Failure Analysis Techniques
- ✓ Implementing FMEA
- ✓ FMEA Procedure
- ✓ Application on FMEA (Exercises)

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Machine Failure Analysis and Prevention

Course Outline

✓ 03 DAY THREE

Machinery Troubleshooting

- ✓ Condition Monitoring
- ✓ Machine Failure Modes
- ✓ Equipment Performance
- ✓ Methods of Detection
- ✓ Applications (Machine Failure)

Structured Problem Solving Techniques

- ✓ Win-Win Problem Solving
- ✓ Development of Problem-Solving Skills
- ✓ Alternative Solution Training
- ✓ Formulate Alternative Strategies
- ✓ Guidelines for Decision Making
- ✓ Priority - Setting

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✓ 04 DAY FOUR

Machine Reliability

- ✓ Reliability, availability, maintainability.
- ✓ Risk Assessment and Management.
- ✓ Life Cycle Management.
- ✓ Reliability & Maintainability.
- ✓ Techniques & Analysis of Reliability.
- ✓ Human and System Reliability.
- ✓ Human Performance Approach.
- ✓ Reliability Centered Maintenance.
- ✓ Centrifugal Pump Reliability Improvement.
- ✓ Machinery Reliability Audits and Reviews.

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 21, 2027	June 24, 2027	4 days	4250.00 $	UAE , Dubai
Jan. 17, 2027	Jan. 20, 2027	4 days	4250.00 $	KSA , Riyadh
Aug. 16, 2027	Aug. 19, 2027	4 days	4250.00 $	UAE , Dubai
Oct. 26, 2026	Oct. 29, 2026	4 days	4250.00 $	UAE , Abu Dhabi

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