



شركة ميرك العربية السعودية
MEIRC Saudi Arabia

Machinery Failure Analysis & Prevention

Duration 5 Days

Introduction

this course covers structured, results-oriented failure analysis methods for all types of machine components and entire machinery systems. Participants will learn how parts fail, why they fail in a given mode, the on-line and off-line symptoms of failure, and general failure prevention methods. 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 rotating and reciprocating machines.

Who Should Attend

The course is designed to all personnel (engineers and/ or technical staff) who are involved in machinery operation, inspection and maintenance, reliability and availability management. Personnel from process industries such as refining, petrochemical, chemical, mining, pharmaceutical, fertilizer, food processing and utilities will profit.

Course Objectives

Upon completion of this Course, participants will gain an understanding of structured, results-oriented failure analysis methods for all types of machine components and entire machinery systems. Participants will learn how parts fail, why they fail in a given mode, the on-line and off-line symptoms of failure, and general failure prevention methods. 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 rotating and reciprocating machines.

Course Outlines:

Day 1

- Failure Analysis and Troubleshooting as a tool for machinery reliability improvement and Life Cycle Cost Reduction
- Causes of machinery failure
- Failure Analysis committee
- Meaning of failure
- Types of failures
- Troubleshooting
- Approach to troubleshooting
- Knowledge and information
- Logic - common sense
- Experience



Day 2

- Inspection Guidance
- Investigation guidelines
- Replacement or Repair
- Performance Checks
- Symptom and Cause Effect
- Developing the Cause-and-Effect Chart
- Case Study
- Root Cause Failure Analysis (RCFA)
- Metallurgical Failure Analysis Methodology
- Failure mechanics: Corrosion, Erosion and wear

Day 3

- Machinery Component Failures:
- Gear Failure Analysis
- Coupling Selection and Failure Prevention
- Oil analysis
- Condition of the oil, i.e., Oil chemistry
- Lubrication system condition - Contamination
- The machine condition itself. Machine Wear
- ISO Cleanliness Code
- Proper sampling techniques
- Sampling Frequency
- Diagnostician Source of wear
- Case histories

Day 4

- Temperature Measurement
- Types of Temperature Measurements
- Applications of IR Fault and Failure Identification
- Sample Applications of Infrared cameras
- Case Studies
- MPI (Magnetic Particle Inspection)
- Basis for magnetic particle inspection
- Limitations of Magnetic particle Inspection
- Applications
- Liquid- Dye Penetrant
- Step process
- Type of the Dye
- Dye Removal



شركة ميرك العربية السعودية
MEIRC Saudi Arabia

Day 5

- Ultrasound Inspection
- Heterodyning
- Ultrasonic detection Applications
- UI detect surface and subsurface flaws
- Ultrasonic Applications
- Leak Detection
- Portable acoustic system
- Case Studies
- Vibration Analysis
- Signature analysis
- Case Study