Machinery Failure Analysis And Prevention

Training Program

Introduction:

The possible reasons leading to machinery failure is important to personnel involved to machinery, operation and maintenance. This will help all of them to take possible precessions in their jobs to avoid future failures.

The actual cause of failure could be studied and analyzed to know what the failure mechanism was. This is most important to be known by maintenance personnel.

This course present 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 analysis and a sequential approach to machinery trouble-shooting and problem solving. A matrix approach to machinery troubleshooting uses illustrative examples in pumps, centrifugal compressors, diesel engines, blowers and fans, reciprocating compressors, engines and gas turbines. Finally, a systematic approach to generalized machinery problem solving is described leading to a highly effective root cause analysis method which will be explained in detail.

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.

Methodology:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include:

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate:

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration.

Course outline:

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

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