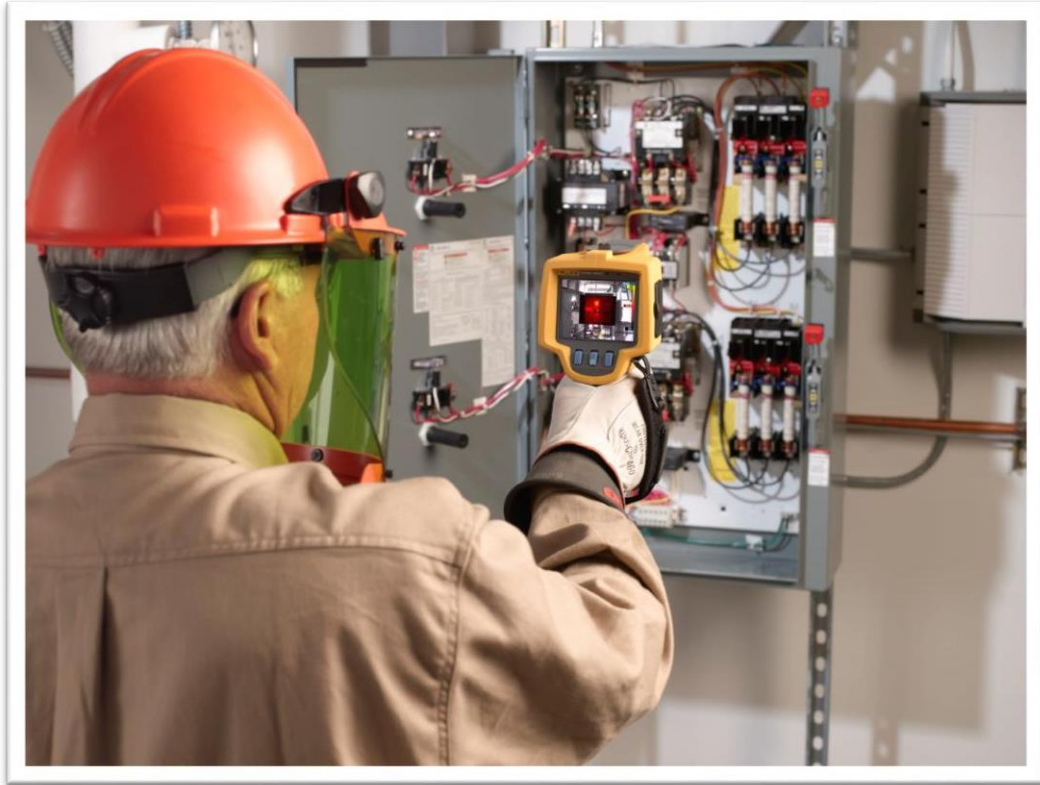




ME111

Advance Predictive Maintenance

Course Introduction:

With ever increasing demands from top management to do more work and decrease costs, investing in predictive maintenance and condition monitoring makes more sense today than ever. While many organizations still rely heavily on time based maintenance, it's a proven fact that condition monitoring maintenance requires less personnel and saves money and downtime.

This course provides the fundamentals of PDM and condition monitoring applicable to plants, facilities and manufacturing lines. Predictive Maintenance & Condition Monitoring will provide students 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. In addition to exposing students to the principles and options for a program, they will learn about real world applications that have benefited other successful maintenance programs.

By the end of this course, participants will be able to go back to their facility and immediately apply what they learned to help make their maintenance process more efficient and less expensive. Training like this never costs – it pays!

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- Identify why time based maintenance doesn't work
- Describe the benefits of a PDM & condition monitoring program
- Identify what equipment to monitor
- Understand different PDM technologies
- Predict what maintenance needs to be done and when
- Choose the right PDM technologies for you
- Measure the effectiveness of maintenance decisions
- Communicate the condition monitoring program through the facility
- Choose a PDM service provider
- Implement a PDM program

Who Should Attend?

This course is a must for anyone who is involved with maintenance at industrial plants, utilities or commercial and private building facilities. This is also beneficial to maintenance, operations & purchasing managers & personnel in Manufacturing Plants, Commercial Buildings, Utilities,

Course Outline:

PDM or condition based maintenance attempts to evaluate the condition of equipment by performing periodic inspections while the equipment is still in service. The ultimate goal of PDM is to perform maintenance "just in time", before the equipment fails in service. This two-day course is for maintenance personnel, operators and managers who desire to understand how condition monitoring can increase the efficiency of their maintenance program while reducing costs. This course will teach you what equipment to monitor, what technologies to monitor it with and how to measure your success. Students will gain an understanding of real world applications to help them implement a PDM program at their facility.

Day 1:

Predictive Maintenance Program Types

- Predictive Maintenance Program Types
- Break down
- Preventive
- Predictive

Failure Rate vs. Time

- Bathtub Curve
- Definition: Weibull Distribution Curve of Failure Rate vs. Time

Sixteen PDM Program Benefits

- How to Develop a PDM Program Worksheet with Microsoft Excel

Four Foundations for Improving Reliability

- Developing and Fostering the Culture of Reliability
- Product Mission
- Reliability Specifications
- Defining Universal Failures

Day 2:

Comparing Maintenance Strategies based on Cost and Availability with "Large Truck Case History"

- Run to Failure
- Scheduled Repair/Replacement

- On-Condition Inspections
- Case History

Basic Concepts of FMEA (Failure Modes and Effects Analysis) and FMECA (Failure Modes and Effects with Cause Analysis)

- Ten Basic FMEA Steps

Techniques for Identifying Probability and Costs of Equipment Failure

- Recovering CMMS Data
- FMEA Data - Failure Modes and Effects Analysis
- IEEE 493 Standards of Electric Motors

Day 3:

Using Maintenance Log Data

- Times-To-Failure
- Suspension Time
- Times-To-Repair
- MTBF - Mean Time Between Failure

Root Cause Analysis for Beginners

- What Happened? How? Why?
- How to do Cause Charting for Root Causes Possible Causes
- Recommendations
- Implementation Action Steps

Interactive exercise - 1.5 Hours

How to Sell Root Cause Analysis to Management

- Preserving Evaluation Data
- Building the Analysis Team
- Analyzing the Data
- Communication of Findings and Recommendations
- Tracking Cost Savings
- Calculating Bottom Line Results
- Case History: How to Set Up a Seal Failure Analysis Program
- Four Step Process used by Predictive Maintenance Services Inc.

Day 4:

The Role of Reliability Centered Maintenance

- NASA's Guiding Principles of RCM

- Five RCM Strategies
- Review of FMECA
- Review of RCFA-Root Cause Failure Analysis

PDM for Manufacturing Plant Operators

The Relationship between Availability and Reliability

- Relationship Chart
- Profit benefits of Operational Availability
- How to Calculate Up-time Value in Profit Dollars

Down-Time Analysis

- F.R.E.D. Reporting - Failure Reporting, Evaluation and Display Reporting

A Review of PDM Technologies - Four Hour Presentation

- Bearing Failure Analysis with Case History
- Vibration Analysis
- Preventive
- Predictive

Day 5:

How PDM Technologies Integrate with RCM-Reliability Centered Maintenance

How to Write a PDM Return on Investment Report

- Interactive Exercise - 1.5 hours

On-Line Monitoring for Instant Machine Condition Diagnostics

- Monitoring Machine Conditions
- How to Make Recommendations for Repair

The Future of Predictive Maintenance

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per course locations. This rate includes participant's manual, Hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session