Preventive and Predictive Maintenance

Energy Milestones Corporation

Advancing Professionals to the next level

Energy Milestones is proud to be accredited, partner and associated with the following association bodies:

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Preventive and Predictive Maintenance

Overview

This course will give participants an in-depth understanding of preventive and predictive maintenance practices; it will also cover many best practice techniques such as Total Productive Maintenance, Reliability Centred Maintenance, Condition Based Monitoring, Failure Modes and Effects Analysis, and Root Cause Failure Analysis.

Course Objectives

At the end of this course, the participants will be able to:

- Develop, implement and supervise the preventive and predictive maintenance program
- Implement the latest techniques and management styles of leading facilities and maintenance management practices
- Optimise the effectiveness of maintenance by using sophisticated techniques and methods to economise time, money and resources.
- Prevent and limit equipment failures, and rework to improve the equipment's overall effectiveness and reliability.y
- Decrease downtime and increase profit for their organisation.

Course Content

1. Maintenance Overview
   - What is maintenance?
   - Formulating the maintenance policy
   - Defining maintenance standards and allocation of resources
   - Applying maintenance strategies

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Course Content

2. Common Issues in an Organisation

- Lack of accountability
- Resource level issues
- Work requests with insufficient information or duplicated
- Importance of writing daily
- Technical history retention
- KPI reviews - how often and why

3. Introduction to Asset Management

- ISO 55000 asset management definitions
- Assets and asset systems
- Different stages of the life cycle
- Asset management decisions and optimisation
- Understanding objectives, cost, critical factors and risk

4. Computerised Maintenance Management System (CMMS) Set-Up

- CMMS set-up
- Criticality assignment SCE
- Production critical
- Non-critical
- Class and classification assessment and allocation
- Defining asset register systems
- Packages
- Equipment assignment
- Allocation of main work centres
- Cost center assignment(s)
- Bills of Material (BOMs) advantages

5. Work Identification and Requesting

- Work preparation: what is required and why
- Equipment assignment to the correct level
- Assigning prioritisation - the benefits of using prioritisation

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Course Content

5. Work Identification and Requesting
   - Best-in-class information required through Corrective Maintenance - Predictive Maintenance(CM-PM) work order(s)
   - Roles and responsibilities for work preparation

6. Work Planning and Estimating
   - Allocation of correct resources and hours
   - Identifying materials using Bills of Material (BOMs)
   - Allocation of external resources with or without Service Level Agreements (SLA)
   - Consider building relationships between activities within work order operations
   - Pre-scheduling through criticality–prioritisation

7. Work Scheduling and Execution
   - Preparing a rolling schedule - What needs to be considered
   - Aligning activities, including input from other departments, and any pre- or post-work
   - Levelling/smoothing of resources through resource centre availability
   - Dates and priorities, and how they impact scheduling
   - Creating and agreeing on the schedule for the next 7 to 14 days' meetings
   - Importance of publishing the 7-day scheduled activities
   - 30, 60 and 90-day schedule look-ahead meetings
   - Time-writing daily and why it improves scheduling control
   - Handling emergent work and its impact on the schedule
   - Considering Extraordinary Maintenance (EOM) to control the high expenditure of corrective maintenance
   - Standard routine procedure instruction(s)
   - Toolbox talk
   - Importance of auditing work execution

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8. Quality Feedback Reporting
- Benefits of feedback forms and technical history retention
- Technical history review and sign off
- Retention of technical history - The importance of future work preparation
- Meeting reviews - What went well and where improvements can be made

9. Completion and Work Control
- Updating the future maintenance plans(s) and asset register through technical history feedback
- Review of estimated versus planned versus actual costs
- Review of person-hours expended versus estimated
- Material usage - Question: Were any materials not used returned to stock?
- Correctly signing off on work order/work request through the CMMS system.

10. Data Analysis Techniques
- Forecasting man-hours, material allocation and Service Forecasting man-hours, and Service Level Agreements (SLA)
- Identification of bad actors through the CMMS system
- Expenditure reporting
- PM compliance reporting
- Schedule compliance reporting
- CM backlog reporting
- Reporting generic materials ordered
- Unscheduled fill-in work
- Mean Time to Repair (MTTR)

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11. Maintenance Replacement Decisions

- Component replacement procedures
- Age-based replacement policy
- Analysis of component failure data
- Using Weibull parameters
- Life-cycle costing

12. Downtime Reduction

- Tracking downtime
- Personnel training
- Importance of feedback from employees
- Outsourcing considerations
- Considering using Overall Equipment Effectiveness (OEE)

13. Performance Reporting

- Primary reporting Key Performance Indicators (KPIs)
- Secondary reporting KPIs
- Leading and lagging KPIs

14. Root Cause Analysis

- Apollo Root Cause Analysis (RCA)
- Combining Reliability Centred Maintenance (RCM) and RCA
- Gathering data and evidence using class and characteristics

15. Why Process

- Cause and effect chart
- Fishbone analysis
- Failure Mode, Effects and Criticality Analysis (FMECA)
- Action plan
- Management of Change (MOC) process
- Continuous Improvement (CI) techniques

Preventive and Predictive Maintenance

Targeted Audience

- Maintenance Managers
- Maintenance Engineers
- Maintenance Supervisors
- Planning Engineers
- Operations Professionals
- Engineering and Purchasing Staff
- Materials Divisions

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games