



ME056: Predictive Analytics and Equipment Maintenance



Training Description:

Maintenance is generally classified into three classes: corrective maintenance (CM), preventive maintenance (PM), condition-based maintenance (CBM) which more recently has been termed predictive maintenance (PdM).

Condition-based maintenance is maintenance when the need arises. This maintenance is performed after one or more indicators show that equipment is going to fail or that equipment performance is deteriorating. Condition-based maintenance was introduced to try to maintain the equipment at the right time. CBM is based on using real-time data to prioritize and optimize maintenance resources. Observing the state of the system is known as condition monitoring. Such a process will determine the equipment's health, and act only when maintenance is actually necessary. Developments in recent years have allowed extensive instrumentation of equipment, and together with better tools for analyzing condition data, the maintenance personnel will be able to decide when is the right time to perform maintenance on some piece of equipment. Ideally condition-based maintenance will allow the maintenance personnel to do only the needed things, minimizing spare parts cost, system downtime and time spent on maintenance.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Review the data to find if the asset being monitored is on an obvious and immediate downward slide toward failure
- ✓ Decode the causal relations between certain type of events and machine failures
- ✓ Detect failures in early stages and preventing them
- ✓ Find 'Remaining life of asset'
- ✓ Schedule predictive maintenance
- ✓ Maintain "Right level of inventory" for spare parts
- ✓ Evaluate "What if" alternate scenarios
- ✓ Determine right warranty period for the assets at the design time
- ✓ Predict breakdown
- ✓ Notify operator at right time
- ✓ Prevent risk of collateral damage and secondary failure
- ✓ Prevent high production downtime
- ✓ Maximise equipment life

Training Designed for:

This course is intended for all technical staff and engineers in the field of mechanical, maintenance and electrical including Managers, Senior Foremen, Supervisors, Technicians and Operators.

Training Program:

DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction
- ❖ Trend Analysis
 - Data archive on equipment asset





- Reviews the data to find if the asset being monitored is on an obvious and immediate downward slide toward failure
- Monitoring points are recommended for arriving at a trend accurately as a reliable measure to find if the condition is deprecating linearly
- ❖ **Pattern Recognition**
 - Decodes the causal relations between certain type of events and machine failures. For example, after being used for a certain product run, one of the components used in the asset fails due to stresses that are unique to that run
- ❖ **Critical Range and Limits**
 - Tests to verify if the data is within a critical range limit (set by professional experience). However, machine learning schemes can be adopted to eliminate user intuition for setting these limits

DAY TWO:

- ❖ **Statistical Process Analysis**
 - Existing failure record data (retrieved from warranty claims, data archives and case-study histories) is driven through analytical procedures to find an accurate model for the failure curves and the new data is compared against those models to identify any potential failures
- ❖ **New Mechanisms for Analyzing Sensors Data**
 - Configuring big data platforms for data collection, management and analytics and are making inroads into sensor data analytics for CBM
 - Powered by machine learning and advanced analytics, this can generate several benefits

DAY THREE:

- ❖ **Advantages of CBM**
 - Detecting failures in early stages and preventing them
 - Finding “Remaining life of asset”
 - Schedule predictive maintenance
 - Maintaining “Right level of inventory” for spare parts
 - Prevent risk of collateral damage and secondary failure
 - Prevent high production downtime
 - Maximizing equipment life

DAY FOUR:

- ❖ **Advantages of CBM (cont'd)**
 - Evaluate “What if” alternate scenarios
 - Determine right warranty period for the assets at the design time
 - Predict breakdown
 - Notify operator at right time

DAY FIVE:

- ❖ **Advantages of CBM (cont'd)**
 - Prevent risk of collateral damage and secondary failure
 - Prevent high production downtime
 - Maximizing equipment life
- ❖ **Course Conclusion**
- ❖ **POST-TEST and EVALUATION**



Training Requirements:

“Hands-on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

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Training & Career Development Department