**Maintenance Management**

**Course Title**

**Maintenance Management**

**Speaker**

**Eng. Moustafa Wahba – Competency Assurance & TVET Consultant**

**Course Description**

**The course is designed to assist the participants to understand Maintenance & Facility Maintenance Management Systems, their philosophies, trends and prospective and be familiarized with Asset Management.**

**In this course, we are going to discuss the concept of Total Productive Maintenance TPM, different generations of TPM, implementation of TPM and Failure Causes.**

**The course will discuss in details the theory of Reliability Centered Maintenance RCM, Performance Standards and Failure Modes.**

**Finally the course will discuss the different type of Maintenance Programmes, their Policies, and Performance Indicators and Development.**

**Course Objectives**

**This course is designed to help the participants to**

1. **Understand Scope of Facilities Management**
2. **Understand Maintenance Management System Elements, Objectives, Philosophies, Trends and Perspectives**
3. **Learn the concept, benefits and process of Asset Management and develop Asset Management Programmes**
4. **Study the principal of Total Productive Maintenance TPM, how TPM is developed in three succession generations and how TPM is implemented.**
5. **Understand Failure Causes, Mechanisms and how to reduce Causes of Failure**
6. **Study Failure Types, Modes, process of Failure Mode and Effects Analysis FMEA & Consequences**
7. **Study different Maintenance Programmes, Policies, Performance Indicators, Methods and Techniques**
8. **Develop and set up Maintenance Programme**
9. **Study Vibration Analysis Theory and how it is used for Trouble Shooting using Vibration Analysis, Non Destructive Tests NDT and Analysis**

**Course Outcomes**

**At the end of this course, the participant will be competent and able to effectively repair and maintain equipment, machinery and facilities utilizing systematic maintenance Asset Management, Total Productive Maintenance TPM & Reliability Centered Maintenance RCM approaches as well as Modern Industrial Maintenance Methods and Techniques.**

**Specific Course Outline**

**The following are the topics covered in the course:**

**Chapter A: Facilities Maintenance Management**

1. **Definitions of Facilities Management**
2. **Scope of Facilities Management**
3. **Facts of Maintenance**
4. **Maintenance Management System Objectives**
5. **Maintenance System Elements**
6. **The Changing World and Evolution of Maintenance**
7. **Maintenance Philosophies**
8. **Trends and Perspectives in Modern Industrial Maintenance Management**

**Chapter B: Asset Management**

1. **Definition of Asset Management**
2. **Capital Asset**
3. **Total Cost of Ownership Management**
4. **The Asset Lifecycle Model for Total Cost of Ownership Management**
5. **Benefits of an Asset Management Programme**
6. **Asset Management Processes**
7. **Developing an Asset Management Programme**

**Chapter C: Total Productive Maintenance TPM**

1. **Total Productive Maintenance TPM - Evolution and Success**
2. **Cost of Poor Maintenance Quality**
3. **The Old Maintenance Function**
4. **The Need for Better Maintenance**
5. **Total Quality Management TQM**
6. **From TQM to TPM**
7. **Development of TPM - First Generation - Total Productive Maintenance**
8. **Development of TPM - Second Generation of TPM - Total Process Management**
9. **Development of TPM - Third Generation of TPM - Total Productive Manufacturing**
10. **TPM implementation**
11. **Overall Equipment Effectiveness OEE**
12. **The Cause of Failure**
13. **The Cost Impact of Failure**
14. **The Failure Mechanisms**
15. **Failure of Working Items**
16. **The Importance of Lubrication**
17. **The Four Phases to Zero Breakdowns through Third Generation of TPM**
18. **Variation**
19. **Reducing the Causes of Failure**
20. **Operator Equipment Management**
21. **Area Based Teams**
22. **TPM Summary**

**Chapter D: Reliability Centered Maintenance RCM**

1. **Reliability Centered Maintenance RCM**
2. **RCM History**
3. **RCM Explained**
4. **The RCM decision process**
5. **RCM based Preventive Maintenance PM**
6. **RCM: The seven basic questions**
7. **Functions and Performance Standards**
8. **Describing Functions**
9. **Performance Standards**
10. **Types of Performance Standards**
11. **Traditional View of Equipment Life**
12. **Types of Failures**
13. **Functional Failures**
14. **Failure Modes**
15. **Failure Effects**
16. **Failure Mode and Effects Analysis FMEA**
17. **Failure Mode and Effects Analysis FMEA Process**
18. **Failure Consequences**
19. **Proactive Tasks**
20. **Default Actions**
21. **What RCM Achieves?**

**Chapter E: Maintenance Programme Development**

1. **Maintenance Programmes**
2. **Preventive Maintenance Activities**
3. **Benefits of PM Programs**
4. **Preventive Maintenance PM Associated Costs**
5. **Setting up a Preventive Maintenance PM Programme**
6. **PM Programme Policies**
7. **PM Program Performance Indicators**
8. **Condition Based Maintenance CBM Methods and Techniques**
9. **Vibration Analysis Trouble Shooting**
10. **Infrared Thermograph**
11. **Ultrasonic Analysis**
12. **Fluid Analysis**
13. **Lubricant Analysis / Fluid Analysis**
14. **Motor Current Signature Analysis MCSA**
15. **Condition Based Maintenance CBM and Predictive Maintenance Techniques**
16. **Setting up a Condition-based Monitoring CBM and Predictive Maintenance PM Programme**

**Training Methodology:**

1. **Interactive/practical training**
2. **Two way communication**
3. **Exercises / Assignments**
4. **Brain Storming**
5. **Case Studies**
6. **Open Discussions**
7. **Ready to use samples**

**Venue / Training Location:**

**To be advised**
**Who Should Attend?**

**The course will be of particular interest to purchasing, maintenance, engineering and operation / process / production professionals from enterprises, companies and organizations in different sectors of industry including Oil & Gas industry that operate different equipment, machinery, plants, systems and facilities. It will also be of interest to suppliers, financial analysts, insurers and lenders to the different sectors of industry to help gain an understanding of what enterprises, companies and organizations can do to actively reduce business risks.**

**Language**

1. **The training materials for the participants will be in English.**
2. **The language of instruction will be bilingual, English & Arabic**

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