Tel No:+97126654546 |Fax No:+97126654182|Email: training@cmc-me.com|www.cmc-me.com

ME240:
Maintenance Optimization & Reliability Engineering

Tel No:+97126654546 | Fax No:+97126654182 | Email: training@cmc-me.com | www.cmc-me.com

Training Description:

Modern organizations operate in an environment where asset performance, uptime, cost efficiency, and risk management directly determine competitiveness. Traditional maintenance approaches — whether reactive or purely schedule-based — are increasingly inadequate in complex, asset-intensive operations. This training course provides a comprehensive, practical framework for optimizing maintenance strategies through reliability engineering principles, risk-based decision-making, and data-driven analysis.

Participants will explore how to transition from routine maintenance practices toward structured reliability-centered methodologies that enhance asset availability, extend equipment life, reduce failures and optimize lifecycle costs. The training course blends engineering concepts with managerial decision tools, ensuring both technical and strategic applicability. Emphasis is placed on real-world implementation, including failure analysis, performance metrics, maintenance economics, and continuous improvement systems.

By the end of the training course, participants will possess a structured understanding of how reliability engineering and maintenance optimization align with business objectives, operational excellence and risk mitigation.

Training Objectives:

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

- ✓ Understand the relationship between reliability, availability, maintainability, and operational performance
- ✓ Evaluate and optimize maintenance strategies using structured methodologies
- ✓ Apply reliability engineering tools to predict, analyze, and prevent failures
- ✓ Conduct root cause and failure mode analyses
- ✓ Integrate risk, cost, and performance considerations into maintenance decisions
- ✓ Develop performance metrics and KPIs for maintenance effectiveness
- ✓ Implement continuous improvement frameworks for asset management
- ✓ Align maintenance optimization with organizational strategy and financial goals

Training Designed for:

This training course is intended for professionals involved in asset management, maintenance, operations, and reliability functions, including; Maintenance Engineers and Managers, Reliability Engineers and Asset Integrity Specialists, Plant / Operations Managers, Mechanical, Electrical, and Industrial Engineers, Maintenance Planners and Supervisors, Asset Management Professionals, Technical and Engineering Decision-Makers and Professionals transitioning into reliability roles.

Training Requirement:

"Hands on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Tel No:+97126654546 | Fax No:+97126654182 | Email: training@cmc-me.com | www.cmc-me.com

Training Program:

DAY ONE:

- Foundations of Maintenance & Reliability Engineering
  - Evolution of maintenance strategies (Reactive → Preventive → Predictive → Proactive)
  - Reliability, Availability, Maintainability (RAM) concepts
  - Failure definitions and failure behavior patterns
  - Asset lifecycle perspective
  - Maintenance vs Reliability: Roles and integration
  - Introduction to maintenance optimization frameworks
  - Common challenges in maintenance systems
- Participants gain clarity on how reliability directly influences safety, cost, productivity and operational risk.

DAY TWO:

- Failure Analysis & Reliability Tools
  - Failure modes and failure mechanisms
  - Failure distributions and reliability characteristics
  - Failure Mode & Effects Analysis (FMEA / FMECA)
  - Root Cause Analysis (RCA) principles
  - Reliability Block Diagrams (RBD)
  - Basic reliability calculations (MTBF, Failure Rate, Reliability Functions)
  - Weibull analysis fundamentals
  - Practical failure investigation techniques
- Participants learn how to move beyond symptom-based troubleshooting toward systematic failure prevention.

DAY THREE:

- Maintenance Strategy Optimization
  - Reliability-Centered Maintenance (RCM) principles
  - Risk-Based Maintenance (RBM)
  - Criticality analysis
  - Selecting optimal maintenance tasks
  - Preventive vs Predictive vs Condition-Based Maintenance
  - Maintenance interval optimization
  - Spare parts optimization considerations
  - Balancing cost, risk and reliability
- Emphasis is placed on practical decision logic rather than theoretical models alone.

DAY FOUR:

- Performance Measurement & Maintenance Economics
  - Maintenance KPIs and performance indicators
  - Availability, reliability, and downtime metrics
  - Cost of failure vs cost of maintenance
  - Lifecycle cost analysis

- Maintenance budgeting and financial justification
- Economic trade-offs in maintenance decision
- Data-driven decision-making
- Maintenance reporting and dashboards

❖ Participants develop an understanding of how maintenance decisions translate into financial and operational outcomes.

DAY FIVE:

❖ Continuous Improvement & Implementation
- Maintenance maturity models
- Continuous improvement methodologies
- Reliability improvement programs
- Change management in maintenance transformation
- Data utilization and digital maintenance systems
- Organizational alignment and culture
- Common implementation pitfalls
- Developing a maintenance optimization roadmap

❖ The program concludes by integrating technical tools, economic considerations and organizational factors into a cohesive strategy.

❖ Course Conclusion

❖ POST-ASSESSMENT and EVALUATION

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, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

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

Training Fees:

TBA 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 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:
Aisha Relativo - Training & Career Development Manager
aisha@cmc-me.com / training@cmc-me.com
Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615