Maintenance Analytics: Data-Driven Decision Making for Reliability & Optimization

Duration: 5 Days

Language: en

Course Code: IND04 - 137

Objective

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

- Apply decision analysis techniques to solve maintenance and reliability challenges.
- Evaluate and manage risks using structured methods like FMEA and fault tree analysis.
- Use multi-criteria decision-making (MCDM) to prioritize maintenance actions.
- Optimize resource allocation and minimize downtime through analytics.
- Leverage CMMS and ERP systems to improve planning and scheduling.
- Build an action plan to implement maintenance analytics in their own organization.

Audience

This course is ideal for:

- Maintenance & Reliability Managers and Supervisors.
- Planners and schedulers in maintenance operations.
- Operations and production supervisors.
- Reliability engineers and analysts.
- CMMS administrators and key users.
- Materials & inventory managers involved in maintenance support.
- Anyone involved in optimizing maintenance strategies and decisions.

Training Methodology

This highly interactive course combines expert-led presentations, group discussions, real-world case studies, and software-assisted exercises. Participants will work on practical examples, apply user-friendly decision-analysis tools, and engage in workshops to practice concepts.

Summary

In today’s competitive and asset-intensive industries, maintenance decisions cannot rely on

intuition alone. Maintenance Analytics equips professionals with advanced decision-making tools and analytical techniques to enhance reliability, optimize costs, and mitigate risks.

This course blends principles of decision analysis, risk assessment, and operational research with hands-on tools and practical case studies to help maintenance and reliability professionals turn data into actionable insights. Participants will learn to evaluate uncertainties, prioritize resources, and design robust maintenance strategies that support organizational goals.

Course Content & Outline

Section 1: Foundations of Decision Making & Risk Management

- Importance of structured decision making in maintenance and reliability.
- Common pitfalls in maintenance decision processes.
- Learning from major failures and building resilience.
- Introduction to reliability analysis and Weibull distributions.
- Fundamentals of risk management and its role in maintenance planning.
- Case examples of poor vs. best practices in decision making.

Section 2: Multi-Criteria Decision Analysis (MCDA) & AHP

- Overview of decision analysis concepts and processes.
- Why bad decisions happen and how to avoid them.
- Introduction to MCDA and Analytic Hierarchy Process (AHP).
- Structuring goals and criteria for maintenance decisions.
- Benefit-cost analysis and resource allocation optimization.
- Workshop: using AHP for real maintenance scenarios.

Section 3: Risk Assessment with FMEA & Reliability Modelling

- Conducting Failure Mode & Effect Analysis (FMEA).
- Understanding Fault Tree Analysis and the Criticality Matrix.
- Calculating Risk Priority Numbers (RPN) and setting priorities.
- Modelling reliability in series and parallel systems.
- The concept of redundancy and its application in critical systems.
- Group exercise: building and analyzing a reliability model.

Section 4: Leveraging MRP & ERP Systems in Maintenance

- The evolution of ERP systems and their relevance to maintenance.

- Materials Requirements Planning (MRP) and its integration with maintenance.
- Understanding the Bill of Materials (BoM) for maintenance planning.
- Creating and managing Master Production Schedules (MPS).
- Practical case studies: aligning maintenance plans with ERP data.
- Group discussion: challenges and solutions in ERP implementation for maintenance.

Section 5: Optimizing Maintenance Policies through Analytics

- Maximizing the value of CMMS data: from records to decisions.
- Benefits and capabilities of next-generation maintenance systems.
- Setting optimum maintenance policies based on data-driven insights.
- Decision support tools for preventive, predictive, and condition-based maintenance.
- Strategies for transforming raw maintenance data into actionable decisions.
- Workshop: designing an action plan for implementing maintenance analytics in your organization.

Certificate Description

Upon successful completion of this training course, delegates will be awarded a Holistique Training Certificate of Completion. For those who attend and complete the online training course, a Holistique Training e-Certificate will be provided.

Holistique Training Certificates are accredited by the British Accreditation Council (BAC) and The CPD Certification Service (CPD), and are certified under ISO 9001, ISO 21001, and ISO 29993 standards.

CPD credits for this course are granted by our Certificates and will be reflected on the Holistique Training Certificate of Completion. In accordance with the standards of The CPD Certification Service, one CPD credit is awarded per hour of course attendance. A maximum of 50 CPD credits can be claimed for any single course we currently offer.

Categories

Engineering, Management & Leadership

Tags

Multi-Criteria Decision Analysis, Analytic Hierarchy Process, Failure Mode Effect Analysis, Risk Priority Numbers, Risk Priority Numbers RPN

Related Articles

Choosing the Best Maintenance Strategy: Understanding 6 Key Approaches

This article explores six maintenance types—preventive, predictive, corrective, condition-based, reactive, and reliability-centered—highlighting their definitions, benefits, and examples. It guides selecting the right strategy based on factors like equipment criticality and industry needs to optimize performance, reduce costs, and ensure safety.