



Decision Analysis for Operation &
Maintenance Professionals



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Introduction

Decision analysis is a practical discipline that helps operations and maintenance professionals choose better actions under time, cost, reliability, and safety constraints. This Decision Analysis for Operation & Maintenance Professionals course builds a mindset for comparing alternatives, prioritizing interventions, and reducing costly uncertainty in maintenance environments. Participants move from the foundations of decision making to advanced methods such as reliability analysis, Weibull thinking, AHP, FMEA, and system modelling. The program connects planning systems, including MRP and ERP, to the maintenance decision workflow, making it a usable management asset. Learners will examine how CMMS outputs can support maintenance optimisation, policy selection, and resource allocation. It strengthens judgment, consistency, and confidence in operational decisions.

Targeted Groups

This Decision Analysis for Operation & Maintenance Professionals training targets professionals seeking knowledge and skills:

- Operations managers.
- Maintenance engineers.
- Reliability and asset management specialists.
- Planning and scheduling coordinators.
- CMMS and maintenance system users.
- Production and plant supervisors.
- Technical decision makers.
- Continuous improvement teams.

Course Objectives

Participants will achieve the following objectives by completing the Decision Analysis for Operation & Maintenance Professionals course:

- Define decision analysis and apply it to operational and maintenance challenges.
- Compare alternatives using structured criteria, AHP, and benefit-cost thinking.
- Recognize how poor decisions happen and how to prevent them.
- Use FMEA, fault tree analysis, and criticality tools to manage risk.
- Interpret reliability, redundancy, and Weibull concepts in system decisions.
- Understand ERP, MRP, and CMMS roles in planning and control.
- Convert operational data into clearer maintenance policies and actions.
- Strengthen judgment through case studies, examples, and group exercises.
- Build confidence in selecting practical solutions under uncertainty, pressure, and change.
- Support more consistent, transparent, and defensible decisions.

Targeted Competencies

Participants will gain the following competencies during the Decision Analysis for Operation & Maintenance Professionals program:

- Analytical reasoning for maintenance and operational choices.
- Prioritisation of tasks, risks, and resources.
- Application of AHP and other multi-criteria tools.
- Risk evaluation through FMEA and fault tree logic.
- Reliability interpretation for series, parallel, and redundant systems.
- Practical use of CMMS, ERP, and MRP information.
- Data-to-decision thinking for maintenance optimisation.
- Clearer evaluation of options, trade-offs, and consequences.
- Stronger support for team-based decision discussions, recommendations, and follow-up.

Studying Scenarios

In this Decision Analysis for Operation & Maintenance Professionals training, participants develop skills through the following scenarios:

- Selecting a maintenance policy when resources are limited.
- Ranking equipment risks before shutdown planning.
- Reviewing CMMS reports to improve intervention timing.
- Comparing ERP and MRP inputs for operational coordination.
- Learning from failed decisions to define better practice.

Course Content

Unit 1: Introduction to Decision Making

- Scope and significance of decisions in operations and maintenance.
- The decision-making process and its practical stages.
- The concept of best practice through learning from worst practice.
- Introduction to reliability and Weibull analysis.
- Case studies and group exercises.

Unit 2: Implementing Multiple Criteria Decision Analysis using the Analytic Hierarchy Process AHP

- Definition of decision analysis.
- How and why bad decisions are made.
- Guidelines for good decision analysis.
- What is AHP?
- Benefit/Cost Analysis.
- Resource allocation.

Unit 3: Risk Management through Failure Mode & Effect Analysis FMEA

- Fault Tree Analysis.
- Risk Priority Number.
- The Criticality Matrix.
- Modelling reliability of systems.
- Series and Parallel Systems.
- The Redundancy Concept.

Unit 4: MRP and ERP Systems

- What is ERP, and how did it develop?
- What is the MRP System?
- The Bill of Materials.
- Master Production Schedule.
- Practical examples.
- Case studies and group exercises.

Unit 5: Decision Analysis for Optimisation of Maintenance Activities

- How to get the most out of your CMMS.
- Benefits that can result from CMMS.
- Optimum decisions for maintenance policies.
- Key features of next-generation maintenance systems.
- How to transform data into decisions.
- Examples of approaches and case studies.

Final Insights & Key Takeaways

This course equips participants to make maintenance decisions that are more structured, defensible, and aligned with operational goals. By combining reliability, risk, planning systems, and decision models, learners gain a stronger basis for long-term maintenance optimisation.