

Operations and Maintenance Decision Analysis Training Course

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Overview

Operations and Maintenance Decision Analysis Training Course is a one-week advanced course for operations engineers, maintenance managers, reliability professionals, asset managers, planners, and technical supervisors who leave with an O&M Decision Analysis Pack. The course replaces informal judgment with structured decision framing, consequence modeling, uncertainty analysis, decision trees, multi-criteria evaluation, lifecycle cost, and defensible records. Agile Leaders Training Center delivers this course on operations and maintenance decision analysis.

Who Should Attend

- Teams responsible for operating constraints, production continuity, and technical risk
- Functions responsible for maintenance strategy, work prioritization, and resource allocation
- Teams responsible for reliability evidence, failure consequences, and asset performance
- Functions responsible for lifecycle planning, investment options, and repair-or-replace choices
- Teams responsible for technical assurance, stakeholder trade-offs, and decision records

The course assumes participants already use operating data, maintenance histories, cost estimates, or risk registers and leaves out introductory problem solving, equipment-specific diagnostics, and leadership decision styles.

Departments and Industries

The course supports evidence-based asset decisions across process operations, utilities, infrastructure, and service facilities.

- Operations, maintenance, reliability, and asset management
- Engineering planning, technical assurance, and capital projects
- Energy, petrochemical, manufacturing, and water utilities
- Transportation, healthcare, property, and data center facilities
- Mining, metals, logistics, and industrial services

Learning Objectives

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

- Apply structured framing to operating and maintenance decisions.
- Build consequence and uncertainty models for competing alternatives.
- Analyze decision trees, expected value, and risk appetite.
- Compare options through multi-criteria and lifecycle cost analysis.
- Evaluate information value, sensitivity, and scenario robustness.
- Prioritize actions and document defensible decision recommendations.

Course Agenda

Day 1: Frame the Decision

- Decision Statement, Scope Boundary, and Ownership Canvas
- Objectives Hierarchy, Success Measure, and Constraint Register
- Stakeholder Value, Trade-Off, and Risk Appetite Map
- Alternative Generation and Feasibility Screening Matrix
- Evidence Source, Quality, Bias, and Assumption Log

Day 2: Model Consequences and Uncertainty

- Consequence Model for Safety, Availability, Cost, and Service
- Probability Estimate, Reference Class, and Confidence Range Method
- Decision Tree Structure, Chance Node, and Outcome Path
- Expected Value and Expected Utility Calculation Sheet
- Operating Constraint and Failure Consequence Scenario Set

Day 3: Compare Maintenance Alternatives

- Multi-Criteria Decision Analysis Scoring Model
- Criteria Weighting and Analytic Hierarchy Process Check
- Lifecycle Cost Model for Operate, Maintain, Repair, and Replace
- Cost-Benefit, Risk Reduction, and Resource Trade-Off Table
- Repair, Refurbish, Replace, Defer, or Retire Decision Gate

Day 4: Test Robustness and Information

- One-Way and Multi-Way Sensitivity Analysis Chart
- Scenario Analysis for Demand, Degradation, Outage, and Cost
- Value of Information and Evidence Collection Decision Rule
- Threshold, Break-Even, and Dominance Analysis
- Decision Recommendation, Assumption, Approval, and Review Record

Day 5: Practice O&M Decisions

- Exercise: Frame a Production Constraint and Maintenance Choice
- Exercise: Build a Decision Tree with Probability and Utility
- Exercise: Compare Repair and Replacement through MCDA and Lifecycle Cost
- Exercise: Test Sensitivity, Scenarios, and Information Value
- Capstone Exercise: Build the O&M Decision Analysis Pack

Practical Exercises

The course uses suggested activities to turn operating and maintenance evidence into traceable choices.

- Suggested activity: frame a utility outage decision with objectives, constraints, alternatives, and stakeholders.
- Suggested activity: model a manufacturing asset decision using probabilities, consequences, expected value, and risk appetite.
- Suggested activity: compare repair, refurbishment, and replacement using weighted criteria and lifecycle cost.
- Suggested activity: test recommendation robustness and prepare a decision record with triggers for review.

FAQs

Who suits operations and maintenance decision analysis training?

Operations and maintenance decision analysis training suits experienced technical teams that already use operating evidence, maintenance history, risk information, or cost estimates to choose among competing actions.

How does operations and maintenance decision analysis differ from general problem-solving training?

Operations and maintenance decision analysis focuses on explicit objectives, alternatives, uncertain consequences, probabilities, preferences, lifecycle cost, and defensible recommendations, while general problem-solving training usually emphasizes issue identification and solution generation.

How are decision trees used in maintenance decisions?

Decision trees organize maintenance alternatives, uncertain events, consequence paths, probabilities, and values so participants can compare expected results and expose assumptions that drive a recommendation.

What is value of information in an operating decision?

Value of information compares the benefit of reducing uncertainty with the cost and delay of collecting more evidence, helping teams decide whether inspection, testing, or analysis is justified.

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How does sensitivity analysis improve repair-or-replace decisions?

Sensitivity analysis shows whether a repair-or-replace recommendation changes when failure probability, downtime, cost, service impact, or useful life varies, revealing thresholds and fragile assumptions.

Conclusion

Participants take back an O&M Decision Analysis Pack. The pack connects objectives, alternatives, evidence quality, consequence models, uncertainty, decision trees, weighted criteria, lifecycle cost, information value, sensitivity, and approval records. It changes scattered technical opinions into a repeatable basis for prioritizing operating and maintenance action.

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