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COURSE BROCHURE

# Decision Models for Maintenance and Operations Training Course

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Registered in the United Kingdom and Saudi Arabia

# Decision Models for Maintenance and Operations Training Course

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Decision Models for Maintenance and Operations is a 1-week training course for maintenance and operations managers, built around an asset investment decision case that each participant prepares for a real repair, replace or upgrade choice. Budgets are tight and every overhaul, spare or upgrade now competes for the same funds, so choices made on instinct are hard to defend. Jupiter Prime Training delivers this course on Decision Models for Maintenance and Operations.

## Why Decision Models for Maintenance and Operations Matter Now

Three pressures shape these choices today. Finance directors and boards ask for a written rationale before releasing money for repairs, replacements or new equipment. Ageing plant forces repeated choices between running to failure, refurbishing and replacing. Condition monitoring and maintenance systems now produce more evidence than managers can read, so they need a way to turn it into a ranked answer. A department that frames choices well wins funding and avoids regret spending; one that does not argues from opinion and loses. The course rests on ISO 55001 asset management systems and its emphasis on risk-based investment and lifecycle cost.

## Who Gains Most from Decision Models for Maintenance and Operations

- Managers who choose between repair, refurbishment and replacement of plant
- Planners who rank backlog work and shutdown scope
- Reliability leads who set spares holdings and strategy changes
- Operations heads who weigh production loss against intervention cost
- Finance partners who review capital requests from engineering

A site leadership group gains most when its maintenance manager, operations head and finance partner attend together.

## Decision Models for Maintenance and Operations Capabilities

Participants move from a list of competing requests to a ranked, costed choice that a sponsor can approve.

- Build decision trees with probabilities and expected values for failure scenarios — investment committee
- Apply weighted scoring to compare vendors, spares and upgrade options — procurement choice
- Use Pareto charts to focus effort on the few assets driving most downtime — maintenance manager
- Calculate cost-benefit, payback and net present value for interventions — finance partner
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Assess options with a likelihood and consequence risk matrix — safety and production leads
- Communicate a recommendation with assumptions and sensitivities stated — approving sponsor

## Key Decision Models for Maintenance and Operations Terms

- Decision tree — a branching diagram of choices and chance events that shows the expected value of each option.
- Expected value — the probability-weighted average outcome of an option across its possible results.
- Weighted scoring matrix — a table that rates options against criteria, each multiplied by an agreed importance weight.
- Pareto principle — the observation that a small share of causes, such as a few assets, produces most of the losses.
- Net present value — the sum of future cash flows discounted to today, used to compare options over different lives.
- Sensitivity analysis — testing how a recommendation changes when key assumptions, such as failure rate or price, move.

## Decision Models for Maintenance and Operations Day by Day

## Day 1: Framing Maintenance and Operations Choices

- Decision Statement and Option Set — Defining What Is Being Chosen
- Run-to-Failure, Refurbish or Replace — Typical Asset Dilemmas
- Line of Sight to Organisational Objectives — Choosing the Criteria
- Cognitive Biases in Engineering Judgement — Avoiding Anchored Choices
- Evidence Sources From Work Orders and Condition Data — Input Quality

## Day 2: Prioritisation Models

- Pareto Analysis of Downtime and Cost — Selecting Bad Actors
- Weighted Scoring and Criteria Weights — Comparing Unlike Options
- Pairwise Comparison of Criteria — Agreeing Weights With Stakeholders
- Backlog Ranking by Criticality and Urgency — Shutdown Scope
- Eisenhower and Impact-Effort Grids — Quick Triage of Requests

## Day 3: Risk and Uncertainty Models

- Likelihood and Consequence Risk Matrix — Ranking Failure Scenarios
- Decision Trees and Expected Value — Handling Uncertain Outcomes
- Failure Probability From Maintenance Records — Estimating Branch Odds
- Value of Information — Deciding Whether to Inspect First
- Sensitivity and Tornado Charts — Testing the Recommendation

## Day 4: Economic Models for Asset Choices

- Cost-Benefit Analysis of Maintenance Interventions — Funding Approval
- Payback, Net Present Value and Discount Rate — Comparing Lifespans
- Lifecycle Cost Comparison — Repair Versus Replacement Timing
- Spares Holding Cost Versus Downtime Cost — Stocking Decision
- Production Loss Valuation — Pricing Unplanned Outages

## Day 5: Practising the Asset Investment Decision Case

- Pump Replacement Case at a Water Treatment Works — Applying Day 3 Trees
- Conveyor Upgrade Choice at a Cement Plant — Applying Day 4 Economics
- Option Ranking With Weighted Scores — Applying Day 2 Models
- Board Paper Structure and Assumptions Log — Sponsor Sign-Off
- Asset Investment Decision Case — Completed for One Real Choice

## Applying Decision Models for Maintenance and Operations After the Course

- Run a Pareto analysis of last year's downtime and present the top five bad actors with a ranked response.
- Rebuild one pending capital request as a decision tree with net present value and a sensitivity chart.

## Decision Models for Maintenance and Operations Questions FAQ

### What are decision models for maintenance and operations, and why do they matter now?

They are structured methods, such as decision trees, weighted scoring and cost-benefit analysis, for choosing between maintenance and operating options. They matter now because tight budgets and ageing plant demand defensible, evidence-based choices.

### Which roles gain most from decision models for maintenance and operations?

Maintenance managers, planners, reliability leads, operations heads and finance partners gain most, since each proposes or approves spending on plant.

### How do decision models for maintenance and operations differ from a maintenance strategy course?

They give the tools to choose between specific options, while a maintenance strategy course sets the overall approach for asset classes and tactics.

## What do you bring back from decision models for maintenance and operations?

You bring back a decision case for one real asset choice, with options, criteria, a decision tree, costs, risks and a recommendation ready for a sponsor.

## Decision Models for Maintenance and Operations: The Way Forward

The asset investment decision case first informs whether a sponsor funds the chosen repair, replacement or upgrade. Maintenance managers present it, finance partners test its numbers, and operations heads confirm its production assumptions. After its first use, revisit how the actual outcome compared with the expected value, and adjust the failure probabilities used next time.