
AI-Driven Asset Investment Planning and Renewal Decisions Training Course

5 – 9 September 2027
Manama





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Programme Summary

AI-driven asset investment planning and renewal decisions is the subject of this one-week training course for asset management and capital planning leaders at advanced level, culminating in an AI-supported asset investment plan for one asset portfolio. Ageing infrastructure, tight capital budgets and rising failure risk force hard choices about what to renew, refurbish or run longer. The approach moves from lifecycle value and risk, through remaining useful life and cost models, to portfolio optimisation and governance. Mars Training Centre UK delivers this programme in AI-driven asset investment planning.

The Business Case

Renewal budgets are often allocated by age, habit or the loudest request rather than by risk and value. Machine learning and digital twins can forecast deterioration and rank interventions across thousands of assets, if the data and models are trusted. Leaders who govern these tools defend capital plans with evidence and avoid premature replacement and costly failures.

- Lifecycle Cost per Asset: Falls as interventions are timed against predicted deterioration rather than fixed age.
- Risk Exposure of the Portfolio: Drops as investment is directed to assets with the highest consequence of failure.
- Capital Plan Approval Time: Shortens as boards receive scenario-based evidence for each funding option.

Principles and Evidence Base

- ISO 55000 and ISO 55001: The asset management system requirements frame how AI outputs feed the strategic asset management plan in Session 1.
- ISO/IEC 42001: Its AI management system requirements shape model governance and accountability in Session 4.
- Lifecycle Costing: Whole-life cost analysis structures the renewal versus refurbishment comparisons in Session 2.
- Risk-Based Prioritisation: Likelihood and consequence of failure underpin the portfolio ranking in Session 3.



Intended Participants

- Leaders accountable for long-term asset investment plans and capital budgets.
- Executives who approve renewal, replacement and life-extension decisions for large asset bases.
- Heads of asset management responsible for the asset management system and its data.
- Senior engineers and planners who build the business case for capital programmes.

The programme serves asset management, capital planning, engineering and finance functions in utilities, transport, oil and gas, and public infrastructure.

Learning Outcomes

1. Participants will be able to diagnose where current renewal decisions depart from risk and lifecycle value.
2. Participants will be able to evaluate remaining useful life and deterioration models for decision use.
3. Participants will be able to prioritise interventions across a portfolio using risk and cost scenarios.
4. Participants will be able to assess the role of digital twins in testing investment options.
5. Participants will be able to construct governance controls for AI used in capital decisions.
6. Participants will be able to justify an AI-supported asset investment plan to a board or funder.

Programme Structure

Day 1: Asset Lifecycle Value and the Role of AI

Where do current investment decisions lose value across the asset lifecycle?

- ISO 55001 Strategic Asset Management Plan and Decision Criteria
- Lifecycle Stages: Acquire, Operate, Renew and Dispose
- Asset Criticality and Consequence of Failure Mapping
- Renewal Decision Audit Against Age-Based Practice
- AI Use Cases Across Asset Investment Planning

Day 2: Deterioration, Remaining Useful Life and Cost Models

How reliable are the forecasts that renewal decisions depend on?

- Asset Health Indices and Condition Data Sources
- Machine Learning Deterioration Curves and Survival Models
- Remaining Useful Life Estimation and Uncertainty Bands
- Lifecycle Cost Comparison: Renew, Refurbish or Extend
- Data Gaps, Bias and Model Validation Tests



Day 3: Portfolio Optimisation and Digital Twins

Which combination of interventions delivers the most risk reduction per unit of capital?

- Risk-Based Prioritisation Scoring and Ranking
- Optimisation Under Budget, Outage and Resource Constraints
- Digital Twins for Scenario Testing of Investment Options
- Long-Term Renewal Forecasting and Funding Profiles
- Trade-Off Visualisation for Executive Decisions

Day 4: Governance, Data and Accountability

How are AI recommendations controlled before they shape capital spend?

- ISO/IEC 42001 Controls for Decision-Support Models
- Asset Data Governance, Ownership and Quality Standards
- Explainability Requirements for Board and Funder Scrutiny
- Human Override and Engineering Judgement Rules
- Model Performance Review and Post-Investment Tracking

Day 5: Applying AI-Driven Asset Investment Planning

Is the investment plan defensible and ready for board submission?

- Applying Day 1 Criticality Maps to the Chosen Portfolio
- Using Day 2 Lifecycle Cost Models to Set Intervention Timing
- Running Day 3 Optimisation Scenarios for the Funding Case
- Stakeholder Communication of Risk and Investment Trade-Offs
- Completing the AI-Supported Asset Investment Plan

Methodology

The programme is built around data workshops and case analysis. Participants test deterioration and remaining useful life outputs on sample portfolio data, run budget-constrained optimisation scenarios and challenge model recommendations. Cases are drawn from water networks, power distribution and road infrastructure.

- Suggested activity: Comparing age-based and risk-based renewal lists for the same asset group.
- Suggested activity: Stress-testing a remaining useful life forecast against missing data.
- Suggested activity: Presenting three funding scenarios to a mock investment committee.



Capstone Output

Each participant completes an AI-supported asset investment plan for one portfolio. It contains a criticality map, a model validation summary, a prioritised intervention list, funding scenarios and governance controls. It is used to support the next capital planning cycle and board submission.

Frequently Asked Questions

Is AI-driven asset investment planning training suitable for senior asset leaders?

Yes. It is set at advanced level for leaders who own capital or renewal decisions and assumes no programming background.

Which standards does the AI-driven asset investment planning programme rest on?

It rests on ISO 55000, ISO 55001, ISO/IEC 42001, lifecycle costing and risk-based prioritisation.

How is the plan from AI-driven asset investment planning training used at work?

You can use it in the next capital planning cycle to justify renewal priorities and funding scenarios to your board.

How does AI-driven asset investment planning differ from a predictive maintenance programme?

It focuses on capital and renewal decisions across the portfolio, while predictive maintenance programmes address maintenance timing on individual equipment.