# Monte Carlo Modelling Training Course: Uncertainty, Loss Ranges and Stress Scenarios

11 – 15 January 2027
Rome

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## Programme Summary

Monte Carlo modelling is the subject of this one-week training course for risk directors, heads of enterprise risk and senior analysts, taught at strategic level and ending in a simulation-based risk paper for committee review. Many risk reports show one expected figure and hide the spread of outcomes behind it. The programme moves from the choice of input distributions to simulation, loss ranges, stress scenarios and decisions on risk appetite, using prepared cases from banking and energy. Mars Training Centre UK delivers this programme on Monte Carlo modelling to mixed-organisation cohorts.

## The Business Case

Leaders who can read a simulated range, question the assumptions behind it and test it under severe conditions set appetite, reserves and limits on firmer ground. The programme works on the measures below.

- Loss Exposure: Becomes visible as a range with a tail, not one expected figure.
- Capital and Reserve Decisions: Improve when buffers are tied to simulated outcomes and stress results.
- Board Reporting Quality: Rises when assumptions, limits and sensitivities are stated openly.

## Principles and Evidence Base

- ISO 31000: The international standard on risk management principles and process, applied in Sessions 1 and 5 to place simulation inside the risk process and to frame the committee paper.
- ISO/IEC 31010: The standard that lists risk assessment techniques, including Monte Carlo analysis, applied in Sessions 1 and 3 to judge when simulation suits a question.
- Probability distributions: The statistical basis for describing uncertain inputs, applied in Sessions 2 and 3 to fit, test and challenge assumptions.
- Scenario analysis: The practice of testing severe but plausible events, applied in Session 4 to build stress cases and read their effect on losses.

## Intended Participants

- Risk directors who set appetite and must defend the evidence behind it.
- Heads of enterprise risk who consolidate exposure across business lines.
- Senior analysts who build or review simulation models for others to rely on.
- Internal audit leaders who challenge model assumptions.

Typical settings include banking, insurance, energy, infrastructure and public finance.

## Learning Outcomes

1. Participants will be able to evaluate whether a risk question suits simulation or a simpler method.
2. Participants will be able to construct input distributions from data and expert judgement.
3. Participants will be able to diagnose weak assumptions, correlation errors and false precision in a model.
4. Participants will be able to interpret loss ranges, confidence levels and tail results for a decision.
5. Participants will be able to design stress scenarios and prioritise their effects on exposure.
6. Participants will be able to justify an appetite or capital recommendation to a risk committee.

## Programme Structure

## Day 1: Monte Carlo Modelling and the Risk Question

When does a risk question call for simulation, and what must be settled before a model is built?

- Risk Process Placement Under ISO 31000
- Technique Selection Guide From ISO/IEC 31010
- Single-Point Versus Range Estimates
- Model Scope and Decision Statement
- Input and Output Register

## Day 2: Distributions, Data and Expert Judgement

How are uncertain inputs described so that the model reflects what is known and unknown?

- Distribution Family Selection Table
- Fitting Distributions to Loss Data
- Expert Estimate Elicitation Sheet
- Correlation and Dependency Matrix
- Data Gap Log

## Day 3: Running and Reading Simulations

What do the results say, and how far can they be trusted?

- Simulation Run Settings and Trial Counts
- Loss Range and Percentile Reading
- Confidence Level and Tail Loss Measures
- Sensitivity and Driver Ranking
- False Precision and Model Challenge Checklist

## Day 4: Stress Scenarios and Appetite Design

How are severe events built into the model and linked to limits?

- Severe but Plausible Scenario Builder
- Reverse Stress Question Set
- Scenario Overlay on Simulated Losses
- Risk Appetite and Limit Calibration
- Buffer Options Table

## Day 5: Committee Risk Paper on One Simulated Exposure

Do the pieces join into a paper that a risk committee can act on?

- Applying the Session 1 Decision Statement
- Reviewing the Session 2 Distribution Choices
- Checking the Session 3 Challenge Checklist
- Testing the Session 4 Limits and Buffers
- Completing the Simulation-Based Risk Paper

## Methodology

The programme is a structured exercise built on prepared loss records, expert estimate sheets and spreadsheet models from a bank and an energy company. Participants fit distributions, run simulations and defend their choices to peers acting as a risk committee.

- Suggested activity: Choosing between two distributions for the same loss data.
- Suggested activity: Reading a tail result and stating what it does not show.
- Suggested activity: Calibrating an appetite limit from a stressed range.

## Capstone Output

Each participant completes a simulation-based risk paper for one exposure. It holds a decision statement, input register, distribution choices, a loss range with sensitivities, stress scenarios and an appetite recommendation. At work it goes to the risk committee and sets the standard for reviewing later models.

## Frequently Asked Questions

### Is Monte Carlo modelling training suitable for risk leaders who do not build models themselves?

Yes. Monte Carlo modelling is taught through prepared spreadsheet models and templates. You need responsibility for risk decisions or model review and a working grasp of averages and ranges, but no programming skill.

## Which standards does Monte Carlo modelling rest on in this training?

Monte Carlo modelling here rests on ISO 31000 for the risk process and ISO/IEC 31010 for technique selection, with probability distributions and scenario analysis as the statistical and testing basis.

## How is the paper from Monte Carlo modelling training used at work?

You take the simulation-based risk paper to your risk committee, and reuse its challenge checklist to review other models.

## How does Monte Carlo modelling differ from a programme on qualitative risk registers?

Monte Carlo modelling quantifies outcomes as ranges with confidence levels from fitted inputs, while a programme on qualitative risk registers rates likelihood and impact by scoring.