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OIL AND GAS | OG-010

Uncertainty Modeling & Risk-Based Decision Making in Energy Projects

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Course content

Why Attend

Energy projects operate under conditions where volatility, technical complexity, and long investment cycles make uncertainty a critical factor in success. Managing this uncertainty effectively requires more than traditional risk registers—it demands structured modeling and disciplined decision frameworks.

This course provides practical techniques to model uncertainty, quantify risk exposure, and support high-impact decisions across the project lifecycle. Participants will learn how to transform uncertain variables into actionable insights, improving confidence in investment, planning, and operational decisions.

Course Methodology

The program is designed to balance theory with practical application through:

- Industry-based case studies from oil, gas, and energy projects
- Guided exercises in uncertainty modeling and risk evaluation
- Group discussions and decision-making simulations
- Step-by-step demonstrations of analytical techniques
- Practical frameworks that can be immediately applied in the workplace

Course Objectives

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

- Model uncertainty using structured quantitative approaches
- Apply risk-based decision-making techniques in complex projects
- Evaluate project scenarios using probabilistic analysis
- Assess the impact of uncertainty on cost, schedule, and performance
- Improve decision quality through data-driven insights
- Integrate uncertainty modeling into project governance and reporting



Course content

Target Audience

This course is suitable for:

- Project Managers and Engineers in energy and oil & gas
- Risk and Planning Specialists
- Investment and Financial Analysts
- Operations and Asset Management Professionals
- Decision-makers involved in capital and strategic projects

Target Competencies

Participants will develop capabilities in:

- Uncertainty modeling and probabilistic thinking
- Quantitative risk analysis
- Scenario development and evaluation
- Risk-based decision-making
- Strategic planning under uncertainty
- Communication of risk insights to stakeholders

Course outline

Day 1: Foundations of Uncertainty in Energy Projects

- Understanding uncertainty vs. risk in energy environments
- Sources of uncertainty (market, technical, geopolitical, operational)
- Risk management frameworks in energy projects
- Techniques for identifying and structuring uncertainty
- Building a robust risk and uncertainty register



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Course outline

• Qualitative assessment and prioritization

Day 2: Quantitative Uncertainty Modeling

• Introduction to probabilistic modeling concepts

• Key statistical tools for uncertainty analysis

• Defining input distributions and assumptions

• Sensitivity analysis and key risk drivers

• Introduction to simulation techniques (e.g., Monte Carlo concepts)

• Interpreting and validating model outputs

Day 3: Risk-Based Decision Analysis

• Principles of decision-making under uncertainty

• Decision trees and expected value concepts

• Evaluating alternatives using risk-adjusted metrics

• Risk appetite and decision criteria

• Scenario comparison and trade-off analysis

• Case study: Energy investment decision

Day 4: Integrated Risk Modeling for Projects

• Linking cost, schedule, and performance risks

• Modeling dependencies and correlations

• Scenario planning and stress testing

• Risk mitigation strategies and optimization

• Introduction to risk modeling tools (conceptual overview)

• Practical workshop: building an integrated model



Course content

Course outline

Day 5: Embedding Risk-Based Decision Making

- Applying risk insights across the project lifecycle
- Governance and risk reporting frameworks
- Communicating uncertainty to senior stakeholders
- Supporting strategic and operational decisions
- Lessons learned and industry best practices
- Final group exercise and action planning



Seminar dates

Available seminar dates

Live dates and pricing for Uncertainty Modeling & Risk-Based Decision Making in Energy Projects generated from the course details page.

Date	Location	Format	Fee
14 - 18 December 2026	London - U.K	Classroom	**€3,360.-**
18 - 22 January 2027	Munich - Germany	Classroom	**€3,400.-**
15 - 19 February 2027	Barcelona - Spain	Classroom	**€3,080.-**
15 - 19 March 2027	Madrid - Spain	Classroom	**€3,400.-**
19 - 23 April 2027	Rome - Italy	Classroom	**€3,400.-**
17 - 21 May 2027	Kuala lumpur - Malaysia	Classroom	**€1,800.-**
21 - 25 June 2027	Barcelona - Spain	Classroom	**€3,080.-**
19 - 23 July 2027	London - U.K	Classroom	**€3,360.-**
16 - 20 August 2027	Munich - Germany	Classroom	**€3,400.-**
20 - 24 September 2027	Barcelona - Spain	Classroom	**€3,080.-**
18 - 22 October 2027	Dubai - UAE	Classroom	**€2,040.-**
15 - 19 November 2027	Rome - Italy	Classroom	**€3,400.-**
20 - 24 December 2027	Kuala lumpur - Malaysia	Classroom	**€1,800.-**

Live online option	Online delivery is available at €1,850.-.