
N503: Economic Risk Analysis for Upstream Projects

Instructor(s): Ed Jankowski and Pete Smith

Format and Duration

Classroom - 5 Days

Summary

The course aims to provide an in-depth knowledge of economics, contracts/taxation and finance/control for upstream economists and controllers.

Learning Outcomes

Participants will learn to:

1. Evaluate uncertainties for projects at different stages of the E&P lifecycle;
2. Formulate problems probabilistically and systematically to assess risks & uncertainties, including exploration, appraisal, marginal, tie-backs, cluster developments;
3. Investigate investment profitability using decision analysis: Develop decision trees to lay-out the logic of the decision and evaluate the robustness of the decision;
4. Validate data using statistical distributions and combine them using both parametric and Monte-Carlo methods;
5. Evaluate forecasts and present them effectively including the correlation between variables. E&P Project Cost Estimation & Control;
6. Integrate risk and uncertainty into key performance indicators;
7. Understand the economic & contractual framework;
8. Project finance, non-technical risk mitigation & control topics (includes oil & gas accounting principles);
9. Portfolio management; asset aggregation, methodology and processes

Training Method

This is a five-day classroom-based course with lectures supported and illustrated by worked examples, case studies and hands-on exercises. The course includes many practical applications and group exercises to develop understanding.

Course Content

Day One (Pete Smith)

- Introduction
- Risk analysis:
 - Utility curves, risk attitudes, and cognitive biases
 - Deterministic versus probabilistic: what is the difference?
 - Histogram, pdf, cdf, percentiles, mean, mode, median, standard deviation
 - Monte Carlo and Applications: A review of the most common distributions used

Day Two (Pete Smith)

- Investment profitability – risk and decision analysis
 - Probability definitions, objective and subjective, calculation rules, expected value
 - Decision trees or Bayes formula and the Value of Information (VOI)
 - Practice of E&P contracts economic modeling

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Day Three - am (Pete Smith)

- E&P Project Cost Estimation & Control
 - Cost estimation vs. project maturity
 - Uncertainty levels understanding
 - Tools

Day Three - pm (Ed Jankowski)

- Economic & contractual framework
 - Introduction to project economic valuation
 - Overview of petroleum contracts
 - Multiple fiscal regimes
 - Unitization principles and examples

Day Four (Ed Jankowski)

- Project valuation
 - Price forecasts
 - Valuation of Reserves
 - Valuation of Resources
- Project Finance, Non-technical Risk Mitigation & Control
 - Sources of non-technical risk
 - Risk sharing and mitigation
 - Non-recourse project finance and Reserves Based Lending
 - Oil & gas accounting principles
 - Management/project control
 - Rolling forecast principles

Day Five (Ed Jankowski)

- Portfolio management:
 - Components, and determinants of asset valuation at different stages
 - Asset aggregation and portfolio optimization: tools of choice to compare projects, expected results and budget efficiencies,
 - Review of methodologies and processes
 - Contribution of risk analysis for portfolio management