



# Petroleum Economics and Risk Analysis

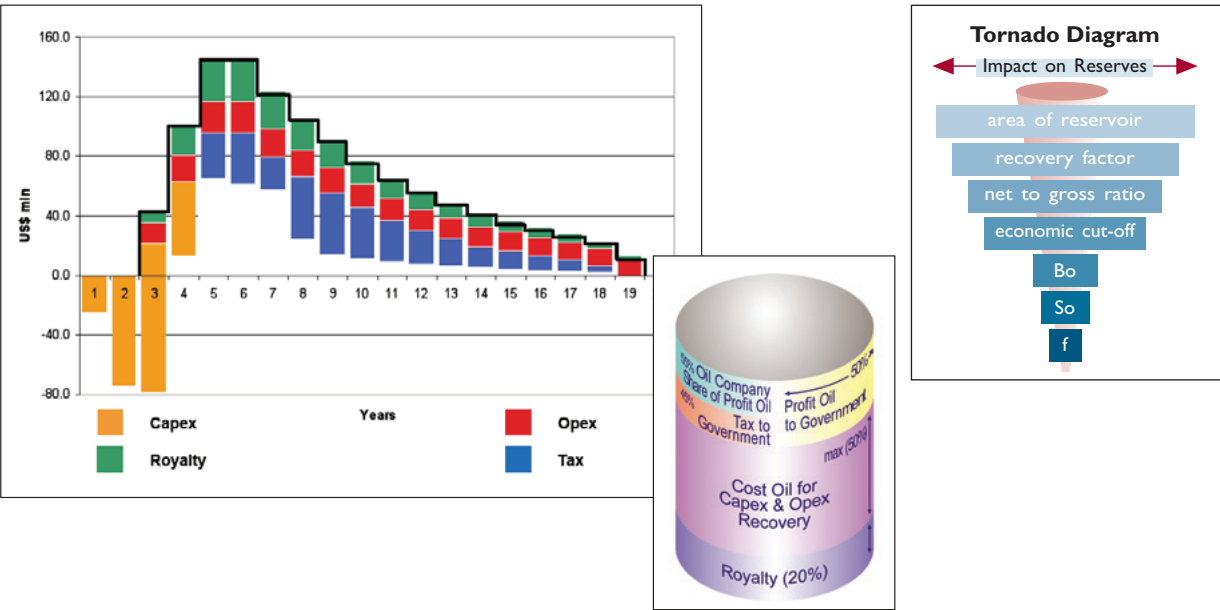
<b>Designed for:</b> The course is designed for staff working in geoscience, engineering, finance, or commercial departments of oil and gas companies, or companies which supply finance or services to the oil and gas industry.	<b>Duration (days)</b>		<b>Learning Level:</b>	
	■ ■ ■ ■ ■		Skills	■ ■ ■
	1 2 3 4 5		Knowledge	■ ■ ■
			Awareness	■ ■ ■

The course will provide a structured approach to defining and analysing petroleum risks in the upstream business.

It will introduce decision-making tools and the supporting software, using case study material taken from oil and gas field examples to ensure direct applicability of the techniques covered.

The initial Petroleum Economics element of the course provides knowledge of the role of petroleum economics in decision making for both exploration and production ventures. It gives participants the skills to perform economic evaluations using a selection of indicators derived from discounted cashflow forecast, to rank projects against alternatives, and investigate economic robustness.

The objectives of the Risk Analysis section are achieved through the use of a case study taken from an offshore oil field development to identify, express and analyse technical and commercial uncertainties. This allows continuity between the various subjects covered. This element will ensure that participants are fully familiar with techniques such as Monte Carlo simulation, Decision Tree Analysis, Parametric Analysis, sensitivity analysis, and that they have the software skills to support the application of these methods. Participants will be working with Crystal Ball and Decision Tree analysis software. Broader issues such as Portfolio Management are also introduced.



Early Development  
E&P Overview  
Reservoir  
Wells

**Business & Risk**  
Open Air  
Coaching  
Master Class





## Petroleum Economics and Risk Analysis continued

### Course Content:

Petroleum Economics - the basis of project evaluation

Introduction

Development Economics

- Constructing a project cashflow
- Profitability indicators
- Inflation and types of money
- Project ranking and screening
- Sensitivity analysis

Exploration Economics

- Probability and expectation curves
- Expected monetary value (EMV)
- Introduction to Decision Tree analysis

Incremental Economics

- Typical incremental projects during the field life cycle
- Evaluating of incremental projects with negligible risk
- Operational decision making under risk

Risk Analysis

- Introduction
- Defining risk and uncertainty
- Identifying uncertainties in the E&P business
- Expressing uncertainty - probability distributions

Combining uncertainties

- Dependant and independent variables
- The Monte Carlo method using Crystal Ball software
- The Parametric Method
- Three point distributions

Tools for Quantifying Risk

- Sensitivity analysis
- Decision tree analysis using commercial software
- Simulation

Technical Uncertainties and their Management

- Exploration
- Appraisal and feasibility studies
- Development planning
- Production

Commercial Uncertainties and their Management

- Market factors
- Human factors

Portfolio Management

- Overview
- The budget line
- Indifference curves
- Market taste combined
- The efficient frontier with respect to risk and value
- Impact of diversification on total portfolio risk

### Course Duration:

Duration is 5 days.

### Courses available from this series:

Strategy & Performance Management  
Petroleum Economics  
Oil and Gas Business Decisions  
Risk Analysis  
Petroleum Economics and Risk Analysis  
Oil and Gas Risk Management  
E&P Business Simulation (Panacea)  
Asset Trading Game  
Petroleum Risk and Portfolio Management

### Course Tutors



**Mark Cook** BSc, MBA

**Main Series tutoring:** Early Development, Business & Risk, Reservoir Engineering

**Industry experience:** 40 years, reservoir engineering, economics and risk analysis

**Career background:** Shell, TRACS (Director) and AGR (VP)

**Personal:** Author, "Hydrocarbon Exploration and Production" (Elsevier 2008), 'Petroleum Economics and Risk Analysis' (Elsevier 2021), SPE distinguished lecturer on Risk Analysis



**David Palmer BA** (Hons) Economics

**Main Series tutoring:** Business & Risk

**Industry experience:** over 25 years, commercial, economics

**Career background:** BP, Britoil, AGR and TRACS

**Personal:** Commercial Manager, Senior Business Analyst, Learning and Development Manager

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