TETRA TECH RPS ENERGY | **TRAINING**

N995: Managing Uncertainty and Risk in Appraisal and Development

Format and Duration
Classroom - 5 Days

Instructor(s): Pete Smith

Summary

The course introduces probabilistic and deterministic approaches, their benefits and shortcomings, as applied to project approval, appraisal, reservoir surveillance and production forecasting. Included is the examination of the factors contributing to project uncertainty; subsurface, drilling, facilities, production, scheduling, cost and economics. The aim is to deepen the understanding of the complex and varying risks involved in delivering accurate estimates of production, reserves and value to key internal and external stakeholders and hence enhance decision making capability.

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 assess risks and uncertainties.
3. Develop decision trees to lay-out the logic of the decision, evaluate the robustness of the decision and competently use the provided software.
4. Estimate and prioritize risks and illustrate them with influence diagrams and Boston squares.
5. Validate data using statistical distributions and combine them using both parametric and Monte-Carlo methods.
6. Evaluate forecasts and present them effectively including the correlation between variables.
7. Select the key variables in a probabilistic evaluation and manage certainty by acquiring additional data (appraisal) or design of interventions (contingency).
8. Conduct probabilistic project scheduling and production forecasting so that a greater awareness of the critical factors to delivery become apparent.
9. Integrate risk and uncertainty into key performance indicators.
10. Select the key variables in a probabilistic evaluation and manage certainty by acquiring additional data (appraisal) or design of interventions (contingency).
11. Conduct probabilistic project scheduling and production forecasting so that a greater awareness of the critical factors to delivery become apparent.
12. Integrate risk and uncertainty into key performance indicators.

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. Since participants may have different levels of background in petroleum economics and statistics there are additionally four optional pre-course eLearning modules that provide a fundamental overview of these topics. Participants are required to bring along a PC laptop running Excel.

Who Should Attend

N995: Managing Uncertainty and Risk in Appraisal and Development

Instructor(s): Pete Smith

Format and Duration
Classroom - 5 Days

The course is designed for petroleum, reservoir and drilling engineers, and geoscientists working in multidiscipline teams.

Course Content

E-learning Modules available to take as a primer for the course

- Value - Measures of project value – Strategic Fit, NPV (Net Present Value) and RoR (Rate of Return)
- Making Decisions – Use of decision trees/ link between studies and decisions
- Statistics and Distributions - key types and parameters
- Combining Distributions - Parametric method

Classroom Course

- Introduction
- Risk and uncertainty fundamentals, definitions
- Bayesian Revision - Value of additional data
- Estimating Probabilities and ranges - Improving estimates by calibration
- Finding a deterministic value that represents a distribution
- Combining Distributions – Monte-Carlo Method - Impact of portfolio choices
- Heuristics of Probability Estimation - ground rules for estimation
- Correlations and dependent variables – how best to incorporate them
- Influence Diagrams and the Boston Squares to identify key risks
- Importance - the variables to focus upon
- The value of Information-Value of Study, cost of delay, opportunity cost
- The value of intervention
- Intervention Planning and Flexibility
- Production Forecasting
- How to improve the process by learning – train wrecks
- Risk Management
- Cost Uncertainty
- Schedule Uncertainty and Critical Paths
- Resource Assessment - Categorisation and classification of petroleum resources
- Intervention Planning and Flexibility
- Production Forecasting
- How to improve the process by learning – train wrecks