

Unconventional Resource Assessment and Valuation

(Open Enrollment Version, 5 days)

DESCRIPTION

This course is focused on effective business decision making in Unconventional Reservoirs. In a realm where we are constantly dealing with limited data, it is critical that we develop the necessary skill sets required to deal with these so-called statistical plays. The course covers the assessment and valuation methods required for the characterization of resource plays from the selection of “sweet spots” to the forecasting of Proved reserves and PUDs using SPEE Monograph 3 methods. The premise for this course is that sound estimation of key engineering, geotechnical, and economic parameters is essential for maximizing profitability. Due to uncertainty and prevailing risks, unconventional resource characterization requires a staged, probabilistic approach conducive to more informed decision-making and portfolio management.

We effectively cover a variety of topics to get you productive quickly, such as:

- Geologic (volumetric and chance) assessment of the resource base (via composite mapping techniques) to find the preferred areas for acreage acquisition and future drilling projects.
- Dealing with limited data sets. It's not that the information is imperfect, it's that we are dealing with an imperfect representation of an unknown population. Rather than call it perfect or imperfect, participants will learn how to quantify the uncertainty in terms of confidence levels relative to the number of well samples and the variance in the mean given the sample size. This knowledge is critical to making educated decisions on pilot well counts, well spacing and the testing of new technologies.
- Developing Probabilistic Production Type curves and methods to aggregate to the Project level. Sound knowledge of aggregation is required for the economic evaluation of resource plays.
- The basis and technique for booking 1P and 2P proved undeveloped (PUD) reserves as per SPEE Monograph 3.
- Decision tree concepts, incorporating value of information techniques. The use of a six Stage Gate process to maximize value by assuring focus on the right elements at each stage.
- How do I know if my Type Curve is still representative? The use of Sequential Accumulation plots to validate that your predictions are still within statistical control. This can be applied to drill or completion costs, cycle time estimates, as well as your production forecasts.

WHO SHOULD ATTEND?

Engineers, Geoscientists, Commercial team members, Business Analysts and Managers who are charged with creating value from their unconventional resources.

WHAT PARTICIPANTS ARE SAYING

“Wonderful, one of the most comprehensive and interactive training courses I have taken”

“Very engaging instructors, able to provide personal stories to illustrate subject matter”

“Fantastic presentations”

“The course was exceptionally insightful and I believe that all attendees gained some perspective on probability assessment and its value in our business”

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KEY THEMES

1) Introduction and Fundamental Concepts

Probability, Distributions and Correlations
Estimating Under Uncertainty

2) Geologic Uncertainty Management

Composite Mapping, Resource and Chance Assessment Associated with
Tight Sands, Tight Carbonates and especially Shale Plays
(In Australia and Asia we have the option to cover Coal Seam Gas Plays)

3) Reservoir Uncertainty Management

Probabilistic Reserves and Aggregation
Confidence of achievement vs sample size
General Assessment and Valuation Process Following a 'Stage-Gate' Approach

4) Performance Based Reserves Estimation

Production Forecasting and Reserves Estimation
Value Drivers and Sensitivity Analysis of Projects
Value of Information and its Utility in Decision Making

5) Making Decisions with Limited Data Sets

6) Integrative Exercise: Utopia Shale Assessment and Valuation

URAV culminates with a team integrative exercise to find and probabilistically quantify the resource potential, and define operational attributes within defined segments. Teams use the analysis to bid for available acreage, drill initial wells and determine how profitable their efforts have been.

TOPICS COVERED

◆ Introduction to Probability and Statistics as the Language of Uncertainty.

- Distribution Types and when to apply
- Sampling and the number of samples required to validate a distribution
- Dependencies and their impact
- Unconventional Resource sampling exercise

◆ Estimating Under Uncertainty

- What is an 80% Confidence Interval
- Deterministic P50 versus estimating P50s using probabilistic ranges
- How to develop P10 to P90 Ranges, reality checks!
- Exercises focused on developing better estimating skills with an emphasis on estimating in ranges, rather than single values

◆ Tight Sand and Carbonate Characteristics and Assessment

- Historical perspective and Paradigm shift of understanding
- The “Basin Centered” gas concept, and the liquid fringe
- Requirements for a Tight Reservoir accumulation
- How to target high graded areas via maps (Common Risk Segment mapping)
- The basics of assessing the chance of Geological success

◆ Shale Characteristics and Assessment

- Mechanisms of Formation and Exploitation history
- The importance of thermal maturity. Vitrinite reflectance oil and wet gas targeting
- The use of Common Risk Segment mapping to identify “sweet spots”
- Volumetric assessment uncertainties
- Fundamentals of gas desorption in shale

◆ Resource and Reserve Estimation

- Concept of the Range of the Average— Porosity, Saturations, and Net pay
- Well Spacing considerations
- PRMS PUD’s booking philosophy
- Booking extended PUD’s using SPEE’s Monograph 3 methodology
- Aggregation Principles
- Probabilistic resource and reserve estimation

◆ Production Forecasting

- Uncertainty in forecasts, Arps vs other methods, B value discussion
- The use of the Duong and Modified Hyperbolic decline for Unconventional gas resources
- The use of Linear flow assumptions in Unconventional reservoir production forecasting
- Production Type Curves – basis for generation, their pros and cons

◆ Decision Trees and the Value of Information.

- Decision Tree basics and the Expected Value concept
- The Value of Perfect and Imperfect Information
- Contingent well locations; how to determine conditional probabilities
- Optimal land acquisition strategy decision tree exercise

◆ Unconventional Resource Assessment

- Unconventional flow processes – how does oil and gas move through a shale?
- Micro seismic and complex fracture networks
- High grading the sweet spots using CRS (Common Risk Segment) mapping
- Developing performance tracking Type curves – How do I know if my Type curves are representative?
- How do I determine which Unconventional plays to select for my company?
- A general work flow for Assessment and Valuation

◆ Making Better Business Decisions based on limited data

- How many wells do I need before I can move to the next stage?
- Can we fast track this program or do we need to slow down?
- How do I determine the range of the mean outcomes from my limited sample size?
- A Shale gas exercise and a Shale oil exercise are worked by the class to develop this understanding
- Quick high grading of acquisition areas based on statistical diagnostic plots