Unconventional Resource Assessment & Valuation

Dates: September 24-28, 2018

Instructor: Jim Gouveia, Rose & Associates
Mark Schneider, Rose & Associates

Location: Gran Meliá Hotel, Jakarta (www.melia.com)

Cost: IDR 38,900,000 Special for Indonesian Residents
Includes lunch and coffee breaks, Excludes VAT
Excludes hotel accommodation
International Participants register at www.RoseAssoc.com

Registration: ihsan.wiratama@opacbarata.co.id T: +62.21.7884.9206

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Unconventional Resource Assessment and Valuation

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 & 4 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. We will cover a variety of topics:

- 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, the participant 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 testing of new technologies.

- Developing Probabilistic Production Type Well curves and how to aggregate them to the Project level. Sound knowledge of aggregation is required for the proper economic evaluation of resource plays.

- Decision tree concepts, incorporating value of information techniques.

- How do I know if my Production Type Well 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

This course is intended for engineers, geoscientists, commercial team members, business analysts and managers charged with creating value. Unlike traditional deterministic methods which call for the ongoing study of key parameters to get ever closer to “The Answer.” Probabilistic methods recognize that most parameters are fraught with uncertainty.

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”
Course Outline

Day 1 – Fundamental Concepts
- Introduction
- Work Processes and Deliverables
- Probability, Distributions, and Dependencies
- Estimating Under Uncertainty

Day 2 – Fundamental Concepts
- Estimating Under Uncertainty (continued)
- Estimating In-Place Volumes & Chance factors
- Aggregation Principles

Day 3 – Reservoir Uncertainty Management
- Quantifying Production Forecasting Uncertainty
- Estimating Resources & Reserves
- Decision Trees & The Value of Information

Day 4 – Reserves and Resources
- Decision Trees & The Value of Information (continued)
- Value Drivers & Limited Data sets
- Decision Stage Assessment

Day 5 – Utopia Shale Exercise

Course Content

♦ Introduction to Probability and Statistics as the Language of Uncertainty.
  - Distribution Types and when to use what
  - Sampling and the number of samples required to validate a distribution
  - Dependencies and their impact
  - Unconventional Resource sampling exercise

♦ Work Processes & deliverables
  - Overview of the key work processes in evaluation of Unconventional resources

♦ Estimating Under Uncertainty
  - What is an 80% Confidence Interval?
  - Deterministic P50 versus estimating P50’s 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

♦ Estimating In-place volumes & Chance of Success
  - How to develop high grading maps (Common Risk Segment mapping)
  - The basics of assessing the chance of Geological success
Aggregation Principles
- Principles of Aggregation
- Aggregation Curves
- Dealing with limited data
- Uncertainty around the mean
- Setting performance targets
- How many wells do I need before I can move to the next stage?
- Performance tracking via Sequential Accumulation plots

Quantifying Production Forecast Uncertainty
- 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 Well Curves – basis for generation, their pros and cons

Estimating Resources and Reserves
- Resources vs Reserves
- Contingent vs Proved, Probable
- PRMS PUD’s booking philosophy
- Booking extended PUD’s using SPEE’s Monograph 3 methodology

Decision Trees and the Value of Information.
- Decision Tree basics and the Expected Value concept
- Conditional dependence modeling – e.g. Pilots

Value Drivers & Limited Data Sets
- 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?
- One Shale gas exercise and one Shale oil exercise are worked by the class to develop this understanding in the attendees.

Decision Stage Assessment
- How do I select the best Unconventional resource for my company?
- Work flow for assessing Unconventional resources

Utopia Shale Exercise
- Apply the assessment concepts covered in the course
- Simulate the workflow you would undertake to assess a liquids-rich shale opportunity:
  - Integrate geoscience, engineering, and economics
  - Use appropriate analytical tools
  - Apply good judgment and sound reasoning with respect to: Sweet Spot Identification; Type Curve Selection; Pilot and Demonstration Well Allocation, Economics and Recommended Acquisition Strategy
About the Instructor

James (Jim) Gouveia (BaSc, Chemical Engineering, University of Toronto) is a registered Professional Engineer with a diverse technical, business and operations background in the petroleum industry. He joined Rose & Associates in March, 2002 after 21 years with Amoco and BP Energy. Mr. Gouveia has worked in a variety of technical and managerial assignments in exploration, production and reservoir engineering, strategic and business process planning, portfolio and risk management. Prior to BP’s acquisition of Amoco in 1999, Mr. Gouveia was a Director of Risk Management for the Amoco Energy Group of North America. In this role he was accountable for assurance of consistent project evaluation of all major capital projects. In his last roles Mr. Gouveia led BP’s strategic initiative into unconventional gas resources in Western Canada.

With BP, he was a member of several task forces including a world-wide task force focused on growth initiatives in mature basins and developing a portfolio management process for BP’s North American unconventional gas assets. Mr. Gouveia has been a key author in the development of Rose & Associates course on the assessment of Unconventional resource plays. He has consulted with firms in North America, South America, S.E. Asia and Australia on the resource, reserve and economic evaluation of their Unconventional assets.

Mr. Gouveia was selected to be a Distinguished Lecturer with the Society of Petroleum Engineers for the 2016/2017 session. His talk is entitled, “Fooled by Randomness”, making better business decisions with limited data sets. During his service at Rose & Associates Jim has provided critical technical advice, consulting and training to a global set of clients from North and South America, Asia, Australia and Europe. Recent engagements include assignments with Chevron, Chesapeake, ConocoPhillips, Encana, PTTEP, and Repsol. Jim’s expertise covers all aspects of oil and gas production, ranging from conventional and tight gas fields, to heavy oil, to unconventional oil and gas. He is the lead developer and custodian of Rose & Associates “Unconventional Resource Appraisal and Valuation” course, a unique offering focused on practical decision making in unconventional resource projects. He regularly presents technical talks at the SPEE annual meetings and local SPE, SPEE Chapters. Mr. Gouveia was a contributing author to the SPEE’s 2011 Monograph 3, “Guidelines for the practical evaluation of undeveloped reserves in Resource plays”, OTC-28499 and SPE 18507, 175527, 175888, and 121525. Jim is a member of APEGA, SPE, SPEE and AAPG. Mr. Gouveia is a Partner with Rose and Associates.
About the Instructor

Mark Schneider P.Eng. (BS Chemical Engineering, BS Natural Gas Engineering, MS Petroleum Engineering) is a registered Professional Engineer with a diverse technical and business background. During a career of over 35 years, he has lived and worked in North America, Europe, and Asia. He joined Rose & Associates, LLP (R&A) in 2010. He started his career in 1981 with Energy Reserves Group (now BHP Billiton) and was a member of BHP’s first Deepwater Group in 1993 when he decided to start an international career with Maxus Energy (now Repsol) in Indonesia.

In 1997, Maxus set up a systematic risk analysis procedure worldwide and he was an original member of the “Risk Normalization Team,” which was responsible for normalizing exploration prospect risking across all business units. Ever since, he has been a champion and mentor of systematic risk analysis and uncertainty quantification. In 2002, he transferred to Madrid where he took on a variety of challenging technical and managerial roles. Prior to his last position with Repsol as the Director Corporate Reserves, he was part of a QA/QC team that monitored all significant worldwide development projects in the upstream business units.

In 2007, he decided to return to Asia and joined CNOOC in Jakarta. In his last role as Manager of Technical Coordination, his responsibilities included New Ventures, Business Development, Joint Ventures, and internal quality control for prospect generation. Throughout his career, he has demonstrated the ability to guide and influence multi-discipline, multi-cultural teams and to complete multiple tasks on schedule; as well as the ability to communicate clearly and effectively across multiple vertical layers within a large organization.

Since joining R&A, he has traveled around the world teaching risk analysis courses and consulting on a wide range of projects ranging from implementing corporate-wide systematic risk analysis processes for the exploration department of a large integrated company to assisting technical teams on individual prospect evaluations. He has also contributed to the technical enhancement of the software programs that are marketed through R&A’s software subsidiary, Lognormal Solutions Inc.

In 2002, he received the SPE Asia-Pacific Regional Service Award. He has served on many local, regional, and international committees with SPE, AAPG, EAGE and IPA. He served three year terms on both the SPE Formation Evaluation Award Committee and Reservoir Description and Dynamics Awards Committee. He was co-chairman on the SPE Asia-Pacific Forum on Stacked, Compartmentalized Reservoirs in Thailand and a steering committee member on the SPE Applied Technology Workshop on Probabilistic Methods in Japan. He is currently a member of AAPG’s Visiting Geoscientist Program. He has co-authored papers published by the AAPG, IPA, SEG, SPE and OTC. He is a member of SPE, AAPG, SEAPEX and IPA. Mark is a Partner with Rose & Associates.
Course Registration

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Cost:        IDR 38,900,000 (Excludes VAT if applicable) Indonesian Residents only
             Includes lunch and coffee breaks
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Name: ________________________________
Company: ________________________________
E-mail: ________________________________
Phone: ________________________________
Mobile: ________________ ________________

Contact Person (if different): ________________________________
E-mail: ________________________________
Phone: ________________________________

Please return this form with payment to:

PT OPAC Barata
Beltway Office Park, Tower C -6th Floor
Jl. Ampera Raya No 9 - 10, Ragunan, Jakarta 12550
T +62.21.7884.9206 I F +62.21.7884.9207  E: ihsan.wiratama@opacbarata.co.id

Payment by transfer should be made to the following bank:
PT. Bank Negara Indonesia (Persero) Tbk.
Gedung Chase Plaza, Ground Floor
Jl. Jend Sudirman Kav. 21 Jakarta 12920
Account Name:  PT. OPAC Barata
Account No.:  880 880 8886 ( IDR)
Swift Code:  BNINIDJA

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Taught in a 3-day format, this course focuses on the concepts and principles of statistics as it applies to the petroleum system, estimation under uncertainty, EUR assessment given success, and chance of success for prospects. An integrated team exercise to map a prospect, build a probabilistic resources distribution and assess the chance of geologic success is used to reinforce the learnings from the course. Also covered are topics on value of information, new plays, portfolio management and performance tracking.

This course focuses on the first two days of our flagship five-day course on Exploration Risk Analysis, primarily on the geotechnical concepts and principles of estimating under uncertainty, especially as related to the measurement of and communication about your prospects. We make use of (1) realistic games and exercises to illustrate principles and mechanics of estimating methods; and (2) analytical procedures involved with uncertainty and risk associated with modern petroleum exploration. The course identifies fallacies and unintended consequences of many corporate procedures for conducting petroleum exploration and shows explorers how to get better at what they do.

**Who Should Attend**
This course is intended for geoscientists and engineers; but commercial team members, business analysts and managers will also benefit.

**Course Outline**

**Day 1 –**
- Introduction
- Statistics
- Dealing with Uncertainty

**Day 2 –**
- Estimating Ultimate Recovery
- Chance of Success and Expected Value
- RMAG Team Exercise Introduction

**Day 3 –**
- RMAG Team Exercise Solution
- Decision Trees and Value of Information
- Play Analysis
- Portfolio Management
- Performance Tracking
### Rose & Associates’ 3-day course: Quantification of Geologic Risk

**DAY 1**
- Introduction

**DAY 2**
- Estimating EUR

**DAY 3**
- RMAG Exercise

#### Statistics
- Characteristics of a Lognormal Distribution

#### Chance & EV
- Decision Tree & VOI

#### Uncertainty
- Estimating With Probabilistic Ranges

#### Play Analysis
- When Do We Use Play Analysis?

#### Portfolio Management
- Inventories and Portfolios

#### Performance Tracking
- Sequential Accumulation Plots

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**Estimating is Serious Business!!**

Effective estimating skills arise from:

- Assessing the expectation of lognormality,
- Appropriating Ranges,
- Flexibility and reality checks,
- The power of independent multiple estimates

**Methods for Improving Estimates Exercise**
About the Instructor

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Risk Analysis, Prospect Evaluation & Exploration Economics

The “Flagship” course from Rose & Associates is returning to Jakarta as an Open Enrollment Course

Dates: October 22-26, 2018
Instructor: Mark Schneider, Rose & Associates
Location: Gran Meliá Hotel, Jakarta (www.melia.com)
Cost: USD $3250 Registration Deadline: Oct 12, 2018
USD $2950 Early Bird Deadline: Aug 22, 2018
Includes lunch and coffee breaks
Excludes VAT
Excludes hotel accommodation

Registration: www.RoseAssoc.com
Rose & Associates’
Risk Analysis, Prospect Evaluation & Exploration Economics
(5 Days)

Our flagship course covers all phases of exploration decision-making and has been presented more than 200 times worldwide over the past ten years. With a strong practical orientation and abundant use of realistic exercises, we illustrate the applications and mechanics of the various concepts and analytical procedures involved in the evaluation and investment analysis of exploration prospects.

The course follows the characteristic chain of considerations that attends most exploration projects, including both theory and application, and integrates the geotechnical, leasing, economics, and management aspects of such ventures. This course utilizes the latest methods for dealing with risk and uncertainty and is recommended for geoscientists, landmen, negotiators, engineers, economists, and management.

Practical application of concepts and methods is demonstrated for participants using real prospects and computer-projected risk analysis software. To reinforce key concepts, there are abundant learning opportunities and exercises in which the student can win or lose small amounts of money. Completion of the course should prepare participants for immediate application and utilization of all concepts and techniques in the economic appraisal of ventures.

Though the course focus is on exploration prospects, the methodology taught is also applicable to appraisal and development projects.

Day 1: Introduction; Statistics: The Language of Uncertainty – Probabilities & Distributions; Coping with Uncertainty; Estimating under Uncertainty Exercise

Day 2: Estimating Petroleum Reserves; Expected Value and Chance of Prospect Success; Truncation Issues; RMAG Exercise (Introduction)

Day 3: RMAG Exercise (Completion); Decision Trees and the Value of Information; Exploration Economics (Estimating Profitability and Economic Metrics); The Most Crucial Decision: Selecting New Exploration Plays

Day 4: Dealing with Risk; Prospect Inventories & Portfolio Management; Acquisition Strategies and Bidding; Performance Tracking; Antelope Ranch Final Exercise (Introduction)

Day 5: Antelope Ranch Final Exercise (Completion and Review); Conclusion

What Participants are Saying: “outstanding exercises”
“highly qualified, engaging faculty”
“great use of anecdotes”
## Rose & Associates’ Flagship Course: Risk Analysis, Prospect Evaluation & Exploration Economics

### DAY 1
- **Introduction**
- **Statistics**
- **Uncertainty**
- **Evaluating WI/PWB Estimates**

### DAY 2
- **DAY 2**
- **Estimating EUR**
- **EV & Chance (Decision Trees)**
- **Dec Tree & VOI**

### DAY 3
- **RMAG Exercise**
- **Economics**
- **New Plays**
- **Performance Tracking**

### DAY 4
- **Risk Aversion**
- **Portfolio Management**
- **Bid Strategy**
- **Making it Work**

### DAY 5
- **Antelope Ranch Exercise**
- **Mapping Prospects**
- **Review: Skill Pays**
- **Making it Work**

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**DAY 1**
- **Introduction**
  - To Improving E&P Performance
  - Characteristics of a Lognormal Distribution
  - Estimating WI/PWB Estimates

**DAY 2**
- **Estimating EUR**
  - Average Net Pay Estimates
  - Decision Trees & VOI
  - Economic Measures

**DAY 3**
- **RMAG Exercise**
  - Decision Trees & VOI
  - RMAG Intro: Regional Map & Sea Floor-2-Sea Floor

**DAY 4**
- **Risk Aversion**
  - Risk Aversion Exercise
  - Portfolio Management
  - Bid Strategy

**DAY 5**
- **Antelope Ranch Exercise**
  - Mapping Prospects
  - Review: Skill Pays
  - Making it Work
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