

**TRAINING TITLE**

**RESERVE ESTIMATION AND UNCERTAINTY**

**Training Duration**

5 days

**Training Venue and Dates**

PE056	Reserve Estimation And Uncertainty	5	05-09 Feb. 2024	\$6,500	London, U. K
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In any of the 5-star hotels. The exact venue will be informed later.

**Training Fees**

- \$6,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultants Certificate of course completion will be issued to all attendees.

**TRAINING OVERVIEW**

**TRAINING WORKSHOP DESCRIPTION**

This course will include various reserve estimating methodologies, classifications, and definitions of these reserves and resources, along with a guideline for the application of these definitions will be covered. PRMS, SPE, WPC, AAPG, SEC, and other regulatory authority guidelines will be discussed. Following the completion of this course, all participants should be able to use deterministic and probabilistic methods, to gain a thorough understanding of various reserve levels and their equivalence in both systems.

**TRAINING OBJECTIVES:**

**After completing the training, the employee will:**

1. To review principles of reservoir characterization and reserves evaluation.
2. To learn about the main concepts of risk and uncertainty management.
3. To learn about integrating risks and uncertainties into reserves evaluation - static uncertainties, dynamic uncertainties, geostatistical modeling, etc.

**WHO SHOULD ATTEND?**

This course is for anyone who works closely with the generating and reporting of reserves, and for those who make or use resource estimates for business decisions.

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## TRAINING METHODOLOGY

This course combines sound engineering, operation and maintenance principles, applicable standards, and best industry practices for reliable and cost-effective process plant systems. Delegates will be encouraged to introduce problems of their own for discussion and analysis. Copies of all lecture materials, case studies, and workbooks will be provided. Group discussions will be carried out on problems faced. This training program is lecture-based and customized to the needs of the audience, providing a meaningful experience for personnel who work in petroleum plants. Daily sessions include formal presentations, prepared in PowerPoint, interspersed with directed discussions and case studies. In addition to formal lectures and discussions, the delegates will learn by active participation through the use of problem-solving exercises, group discussions, analysis of real-life case studies, etc. Many relevant videos will be shown during the training.

All attendees receive a course manual as a reference.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

## Course Program

### Day -1

- Introduction:
  - Standardization Entities, Resources, Field Life Cycle & Classification framework.
- Estimating recoverable quantities: Analytical procedures (Analog, Volumetric & Production Performance), Deterministic and probable methods (Aggregation Methods, Probabilistic and deterministic methods).

### Day -2

- Deterministic & Probabilistic Method (Cont. D)  
Pitfalls, Arithmetic or Dependent Summation, Probabilistic or Independent Summation, Aggregating over resource classes, and Scenario methods.
- Normalization & Standardization of Volumes.
- Seismic Estimation of Reserves & Resources: Introduction, Uncertainty in Seismic Predictions.
- Unconventional Resources Estimation: Risk & Uncertainty, Reservoir & Hydrocarbon Characteristics, Tight gas,
- Unconventional Resources: Coal-Bed Methane, Global Potential, Exploration & Development Considerations,

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**Day – 3**

- Reserve Calculation: Favorable Properties for Oil Recovery, Favorable Properties for Gas Recovery.
- Rock Properties: Rock Property Measurement Methods, Porosity, Permeability, Saturations, Net-Pay Thickness.
- Volumetric Reserves Estimation: What are reserves? Reserve uncertainty, Volumetric Estimates of Oil Reserves, Inputs to Volumetric Reserves, Examples and Exercises, Volumetric Estimate of Gas Reserves, Recovery Factors of Gas Reservoirs, and Exercises.

**Day – 4**

- Material Balance (MB): MB Applications, Basic theory and concepts, Material balance analysis, Volumetric oil reservoirs, Volumetric gas reservoirs, Aquifer driven reservoirs.
- Fluids & Rock Properties, MB Equation, Reservoir Pore Volume, Change in Reservoir Oil Volume, Change in Free Gas Volume, Change in Reservoir Water Volume.
- MB Analysis: Data Requirements, Data Preparation, Black Oil MB, Gas Reservoir MB, Common Pitfalls.
- Gas Reservoir Fluid Models: Volumetric Dry Gas Reservoir, Volumetric Wet Gas Reservoir, Straight Line Analysis Technique, Common Pitfalls.

**Day – 5**

- Conventional Decline Curve Analysis: Why Decline Curve Analysis? What Can Change the Trend?
- The Arps Equation, Hyperbolic Exponent, Required Plots, Hyperbolic Decline, Exponential Decline.
- Harmonic Decline, Nominal & Effective Decline, Harmonic Decline Solution, Examples, Production Forecast.
- Hyperbolic Decline Solution, Forecast, Examples, Abandonment Forecast.

NOTE:

**Pre & Post Tests will be conducted.**

**Case Studies, Group Exercises, Group Discussions, Last Day Review, and assessments will be carried out.**

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