

A LDI Training Course

INTEGRATED RESERVOIR MODELING

Dr. Asnul Bahar

BENEFITS OF ATTENDING

- ❖ Learn the state of the art technology in Integrated Reservoir Modeling from development of fine scale geological model into upscaling of dynamic flow simulation model
- ❖ Understand the overall workflow process and master the techniques for reservoir modeling based on example of actual field data
- ❖ Know how to generate and rank multiple realizations to capture various uncertainties for volumetric calculations,
- ❖ Learn how to design of optimum upscaling level and appropriate technique for upscaling of reservoir properties
- ❖ Understand the importance of multiple models for integration of production data during history matching process
- ❖ Learn how to use computers and software to generate reservoir model

INTRODUCTION

In this practical course, you will learn how to develop multiple reservoir models that captures various uncertainties, which will be very useful for full field reservoir development plan.

The workshop consists of both theoretical and computer exercise on how various types of data (geological, geophysical, petrophysical and engineering) are integrated using 3D reservoir modeling softwares, as well as on step-by-step procedure of reservoir modeling process. This includes how to generate consistent 3D reservoir model with the original well data as well as with the external 1D, 2D or 3D trends, to use experimental design for handling multiple realizations, to perform proper upscaling, and to conduct history matching.

The workflow will be demonstrated using commercial software, namely PETREL.

COURSE CONTENT

Introduction

- Overall Workflow of Integrated Reservoir Modeling
- Review of Geostatistics

Static Geological Modeling

- Structure Framework Modeling
 - Fault Modeling
 - Areal Gridding
 - Horizon, Zonation, and Fine Vertical Layering
 - Scale Up Well Logs
- Role of Rock Typing
 - Relationship between Geological Facies and Rock Type

- Integration of Geological Facies and Petrophysics for Rock Type Scheme
- Rock Type Scheme and Dynamic Model
- 3D Facies Modeling
 - Methodology : SIS, TGS, MPS
 - Hierarchical Facies Modeling Approach
 - Integrating Conceptual Geological Model and Other Trend
- 3D Porosity Modeling
 - Methodology : Co-Simulation of Porosity and Facies Modeling
 - Integration of Seismic Attributes
 - Deterministic Inversion
 - Stochastic Inversion
- 3D Permeability Modeling
 - Methodology : Linear Regression vs. Co-Simulation Approach
 - Integration of Engineering Data (Well Test and Production Test) to Improve Permeability Model
- 3D Saturation Modeling
 - Methodology : Capillary Pressure, J-Function and Sw-log Integration
 - Volumetric Calculation

Introduction to Uncertainty Analysis with Experimental Design

- Workflow
- Sensitivity Analysis
- Uncertainty Analysis
- Proxy Modeling

Upscaling

- Introduction to Upscaling
- Design of Vertical Upscaling Level using analytical and numerical methods
- Upscaling of Reservoir Properties (Facies, Porosity, and Permeability)
- Transmissibility Adjustment for Maintaining Fine Scale Heterogeneity

Integration of Production Data through History Matching Process

- Introduction to Flow Simulation
- Achieving Objective of History Matching
- Assisted and Automatic History Matching
- Quantifying the Uncertainty

WHO SHOULD ATTEND

This workshop is designed for:

- Geologists
- Geophysicists
- Reservoir Engineers
- Petrophysicist
- Petroleum engineers
- Simulation and reservoir modeling engineers

YOUR COURSE INSTRUCTOR

Based in the USA, Dr. Asnul Bahar is the Worldwide Operation/Business Development Manager and Principal Consultant for Kelkar and Associates, Inc. As an international consultant since 1997, he has served many oil companies in the USA, the Middle East, Russia,

South America and Asia. Dr. Bahar received his BS in Mechanical Engineering from ITB, Indonesia, and his M.S. and Ph.D. in Petroleum Engineering from the University of Tulsa. His expertise focuses on development of reservoir description for both carbonate and clastics reservoirs. His responsibilities range from integrating data from various sources such as seismic, geological, and engineering data into reservoir description to history matching of production data. He is the author of the various software developed for applications in integrated reservoir description. He has published numerous papers in the area of reservoir description.

Enrollment Information

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