

RE5

APPLIED RESERVOIR SIMULATION (An Applied Workshop using Eclipse 100)

Dr. O. B. Abu-elbasha or Dr. H. Uba

Fees: 3200 €

DUBAI: 18 – 22 Feb. & 23 - 27 Sep. 2019

COURSE OVERVIEW

This Practical course/workshop is intended to acquaint and guide the participants through recommended steps for performing a reservoir simulation study. It is designed to give the participants hands-on experience using personal computers and ECLIPSE software. The different stages of the study are thoroughly discussed and practiced using real field data. It shows the benefit of systematic addressing of the different steps in optimizing the staff efficiency and project control (Teamwork). It is presented by Experienced Reservoir Simulation Consultants with worldwide experience.

WHO SHOULD ATTEND

Management Staff, Petroleum Engineers, Reservoir Simulation Engineers, Development Geologists, Petrophysicists, and Economists.

This **course is vital** for any Petroleum Engineer who has to participate in reservoir simulation studies or willing to specialize in the Reservoir Engineering discipline.

COURSE CONTENTS

1. INTRODUCTION

- a. Aim of the course.
- b. Definitions and Descriptions.
- c. Classification of Simulators.
- d. Conducting a Simulation Study.

2. MAJOR STEPS IN A SIMULATION STUDY

- i. Integrated Teamwork.
- ii. Static Model Preparation.
- iii. Quality Control (QC) of the Static Model.
- iv. Dynamic modeling.
- v. History Matching (HM).
- vi. QC of the HM.
- vii. Prediction of Future Performance.
- viii. Study reporting.

3. RESERVOIR DESCRIPTION

- a. Overview of steps involved in Reservoir Description.
- b. Data types and Sources.
 - i. PVT, Pc, Kr data.
 - ii. Log & Test data.
 - iii. Statistical data.
 - iv. Other data types.
- c. Scales.
- d. Synergistic approach in Res. Description.
- e. Reservoir Model Generation.
 - i. Analytical methods.
 - ii. Construction of the Static model for Simulation.
 - iii. Inter-well data Generation.
 - iv. Discretization & Up-scaling.

4. DATA QUALITY CONTROL (QC)

5. PREPARATION OF PVT DATA

- a. Classification of Reservoir Fluids.
- b. Handling Laboratory reports and preparation of PVT input data.

6. CAPILLARY PRESSURE (P_c) INPUT DATA

- a. Variation of P_c data
- b. Saturation Height Function.
- c. Averaging P_c data.
- d. Variable Oil-Water-Contacts.
- e. Problems resulting from using erroneous P_c data.

7. RELATIVE PERMEABILITY (K_r) DATA

- a. Reservoir Heterogeneity.
- b. Averaging K_r data.
- c. Corey function.
- d. Critical saturations & hysteresis.

8. POROSITY DATA

- a. Porosity Permeability relations.
- b. Calculation Problems caused by low porosity areas.
- c. Trimming the model.

9. WELL SPECIFICATIONS

10. AQUIFERS

- a. Aquifer Types.
- b. Aquifer directions and connection to the reservoir.
- c. Sizing the aquifer.

11. FAULT MODELLING

- a. Characteristics of Fault Planes.
- b. Fault plane Transmissibility.
- c. Fault representation.

12. SIMULATION GRIDS

- a. Types of Simulation Grids.
- b. Local Grid Refinement.
- c. Discretization.
- d. Corner-point Geometry.

13. TRANSMISSIBILITY MODIFICATION

14. DATA INTEGRATION.

15. INITIALISATION AND RECONCILIATION

- a. Reconciling the OWC, GOC, STOIP, GIIP.
- b. Verification of Model Geometry, Pressure, and Saturation Distribution.

16. HISTORY MATCHING

- a. Control Criteria.
- b. Global Pressure Match.
- c. Aquifer Tuning.
- d. Detailed Well Match.
- e. Match elements.
- f. Pitfalls in History Matching.
- g. Teamwork in History matching.
- h. QC of the History Match.

17. PERFORMANCE PREDICTION

- a. Planning the Prediction Runs.
 - i. Run types.
 - ii. Relating the runs to the terms of reference.
 - iii. Suggested Scenarios.
- b. Performance Optimization.
- c. Iteration with Economists or the Management.

18. STUDY REPORTING

19. HANDLING FUTURE QUESTIONS

THE LECTURERS



Dr. O. B. Abu-elbashar

BRIEF CV. OF DR. ABU-ELBASHAR

Dr. Omar Badawi Abu-elbashar has 34 years of Petroleum Industry experience, and is the Managing Director of PETRO-TEC. He is specialist in Compositional and Black-oil reservoir simulation; field development planning, and Reservoir Management.

He obtained his Ph.D. in Res. Eng. from the Petroleum Eng. Dept. Of the Imperial College, London University, in 1990, and conducted a post-doctoral research in reservoir modelling in 1991.

As a Free-lance Consultant he is now working in **Res. Management of Burgan field, Kuwait**. Prior to KOC he worked in Res. Management of **Fahood field Shell/PDO Oman**, Team leader of Simulation Studies in PETRO-ENERGY (CNPC), **President of PetroSA Local co. In Sudan** (Salima Oil), Consultant reservoir simulation Eng, GNPOC, 2004-2007, Simulation Consultant PDO Oman 2001-2003, Simulation **Consultant Soekor of South Africa**.

In 1996-1998 he joined **Shell Nigeria** as a reservoir simulation consultant working on water injection and gas injection studies. He also worked on PVT modelling, Quality Control of Simulation Input data, and trained the staff in guided FDP's.

He authored many papers in Reservoir Simulation, Modelling, & quantification of the effect of different heterogeneities on hydrocarbon recovery.