Essentials of Engineering Reservoirs

Fundamentals of Reservoir Engineering training seminar

Introduction

In order to facilitate cross-disciplinary exchange of ideas and expertise, this Course N Carry Fundamentals of Reservoir Engineering training seminar presents reservoir engineering principles and procedures. It gives you the information you need to comprehend these questions that are important to reservoir engineers: How much petrol and oil are there overall? To what extent are reserves recoverable? How quickly (rate) can it be recovered? Participants will have a basic understanding of reservoir engineering by the end of this Course N Carry Oil & Gas Technology training seminar, which they can apply to other training sessions.

Featured in this Course N Carry training seminar are:

- Talks about how reservoir engineers work with other disciplines in the petroleum industry, as well as their involvement in exploration and production
- An explanation of the characteristics of reservoir rock, Darcy's Law, and the principles of fluid flow in porous media
- An explanation of the characteristics and phase behaviour of reservoir fluid
- An overview of diffusivity equation application and well testing
- An overview of the various propulsion systems and a conversation on the recuperation elements
- The Fundamentals of Material Decline and Balance Analysis of Curves
- Utilising notions of immiscible displacement and fractional flow equations
- Production forecasts, assessment of the amount of oil and gas in place, and definition of reserves

Objectives

Following this training session, attendees will:

- List the fluids that are present in a hydrocarbon reservoir and describe it.
- Show how these fluids are spread in a hydrocarbon reservoir using diagrams.
- Give an explanation of fluid saturations, permeability, and porosity.
- Identify the characteristics of water, oil, and natural gas.

- Define and explain bubble point pressure, oil and gas formation volume variables, gas oil ratio, saturated and undersaturated reservoirs.
- Determine the recovery parameters and the amount of hydrocarbon in the environment. Calculate the hydrocarbon in situ for gas reservoirs, saturated reservoirs, and under-saturated reservoirs using the general material balance equation.
- To calculate the amount of oil in place for saturated reservoirs and under saturated reservoirs, apply the Havlena and Odeh technique.
- Utilising data from well tests to calculate permeability, skin effect, productivity index, and average reservoir pressure
- Talk about the recovery elements of various drive methods.
- Describe the use of ideas of immiscible displacement and fractional flow equations.
- Analyse declining curves.

Training Methodology

A range of learning strategies will be employed in this Course N Carry Essentials of Reservoir Engineering training seminar to guarantee that the material is understood, comprehended, and retained as much as possible. There will be a lot of interaction and participation in the daily workshops. This entails reviewing questions on each topic and having regular discussions on applications.

Organizational impacts

Professionals of all stripes can benefit from this Course N Carry training programme, but the following will be very helpful:

- Engineers for reservoirs and petroleum
- Engineers in Production and Operations
- Engineers in reservoir, production, and operations
- Geo- and petroleum-physicists
- Managers who are not engineers but are geologists and who want to make more decisions on field development

Personal Imapct

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Course Outline

Day 1

Basics of Reservoir and Reservoir Engineering

- Overview of Engineering Reservoirs
- Life Cycle of Reservoirs
- Properties of the Formation and the Reservoir Environment
- Finding the Contacts
- The meaning of reservoir pressure and how pressure gradients are calculated

Day 2

Conditions of the Reservoir

- Surface Conditions and Reservoir
- Volumetric Formation Factor, Viscosity, and Solution Specific Gravity, API Gravity, and Gas-Oil Ratio
- Calculating Water, Gas, and Oil Properties Using Correlations

- Utilising Deviation Factor in Ideal Gas Law Application
- The Basics of Fluid Flow Relative Permeability Concept and Darcy's Law

Day 3

Principles of Reservoirs

- Fundamentals of Well Testing in Reservoir Description
- Calculating the Average Pressure
- Diffusivity Equation Application to Steady, Semi-Stable, and Unsteady States Line Source Solution Flow Applications to Calculate Reservoir Pressure
- Synopsis of Well Testing Methodologies
- Utilising Well Testing

Day 4

Materials Balance Analysis Principles of Reservoir Drive Mechanisms

- Utilising Fractional Flow Formulas
- Concepts of Immiscible Displacement
- Concepts of Rehabilitation

Day 5

Forecasting Production and Estimating Reserves

- The Meaning of Reserves
- API Correlations with Recovery Factors
- Calculating Oil-in-Place
- Calculating Gas-in-Place
- Production Prediction and Decline Curve Evaluation