Leaders Development Institute

Certified Courses

Reservoir Management and Monitoring

INTRODUCTION

- This training course is designed to identify the sources of the reservoir engineering data. In addition, it will highlight the benefits of integrating the engineering data in the reservoir management of the mature fields. Data acquisition and integration will be presented. Requirements for successful operation of the matured reservoir throughout its entire life will be emphasized.
- The reservoir life cycle and the sequences of the production recovery mechanisms will be discussed. The course will clarify how the integrated and the sound reservoir management is the key to realize an effective development plan and a successful operation throughout the reservoir's life. The course will provide the principles to manage the reservoirs and enhance the recovery from the remaining oil & gas-in-place. The successful applications of the reservoir management concepts will lead to achieve high recovery factors.
- Reservoir engineering and management is a combination of science and art. Therefore, the course will discuss the application of the scientific principles and concepts to solve issues arising during the development and production of oil and gas reservoirs. The analysis for the reservoir behaviour and the production performance will be covered. In addition, the course will provide many tools and techniques to help address the challenges of providing a more reliable and sound reservoir engineering and management. The reservoir management economics and improved recovery processes will be presented. Case studies reflecting different fields will be discussed.

This training course will feature:

- Reservoir management process, components and plan
- Reservoir engineering data
- Reserves estimation and classification
- Reservoir drive mechanisms and producing characteristics
- Determination of hydrocarbon in place
- Describing waterflooding
- Waterflood monitoring and management
- Oil recovery enhancement techniques

PROGRAMME OBJECTIVES

By the end of this training course, participants will learn to:

- Use appropriate approaches in reservoir engineering and management
- Be familiar with the appropriate data collection, analysis, validation and integration process
- Illustrate the points of integration between the different disciplines (geoscience, engineering,..etc.) during the applications of the reservoir management concepts
- Applications
- Ensure the appropriate execution of the reservoir management process
- Use the Interdisciplinary Synergistic approach to efficient reservoir management
- Include each reservoir management component and the importance of timing and cost/benefit analysis
- Apply the different methods of reservoir performance analysis and forecast & give emphasis on the integration of production/injection data, pressure data and any subsurface data
- Acquire an up to date knowledge on the improved recovery processes related to waterflooding, thermal methods, chemical methods and EOR screening guidelines

TRAINING METHODOLOGY

- This training course will utilize a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. The course is designed as a blended environment of presentation; workshops; group work; practical exercises; field application/ analysis and several industry videos showing all processes; and general discussions.

PROGRAM OUTLINE

Reservoir Management Process, Components and Plan

- Definition of reservoir management: an integrated, interdisciplinary team effort
- Reservoir life cycle
- Scope and objective for integrated reservoir management
- Fundamentals and resources of reservoir management
- Reservoir management concepts and processes
- Reservoir management plans
- Synergy and team
- Responsibilities for team members
- Integration of geoscience and engineering
- Setting goals: goal setting, planning, implementing, monitoring, and evaluating reservoir performance
- Developing plan and economics (scenarios): field development and field operating plans to optimize profitability
- Why integrated reservoir studies
- Revision of plan & strategies

Reservoir Engineering Data

- Data needed for integrated study
- Data types: reservoir rock & fluids properties
- Data acquisition, validation, analysis and management
- Integration of production/injection data, log data, pressure data and any subsurface data for analysis
- Efficient monitoring of reservoir performance
- Identifying and acquiring critical data, data acquisition, and analysis
- Reservoir performance analysis and forecast
- Static geological model and reservoir simulation
- When simulation models are required
- History matching and identification of by-passed oil
- Total integration of surface and sub-surface

Reserves Estimation and Classification/ Reservoir Drive Mechanisms and Producing Characteristics

- Induction of new technologies to maximizing economic recovery and minimizing capital investment, risk and operating expenses.
- Timing
  of field implementation of reservoir management plan: during the primary recovery, pr essure maintenance, and secondary and tertiary recovery
- Reservoir management plans and scenarios
- Economic model, uncertainties and risks
- Maximizing economic recovery and minimizing capital investment, risk and operating expenses
- Oil reserves types and classification & reservoir engineering and evaluation
- Natural producing mechanisms
- Reservoir performance analysis and forecast
- Estimation of reserves and prediction of reservoir performance
- Determination of hydrocarbon in place (volumetric method, decline curve method, material balance method, and mathematical simulation

Waterflood Monitoring and Management

- Secondary recovery and pressure maintenance process
- Waterflood management in mature fields: surface as well as sub surface issues.
- Describing water flooding definition and objectives, candidates, patterns, factors affecting pattern selection, well spacing, fractional flow, performance measures, practices and problems
- Design aspects of water injection system
- Water injection systems: water sources (produced water, aquifers and seawater), water compatibilities and scale, and basic water treatment
- Water quality: quality issues and associated risks, effect of injection water quality on injectivity
- Waterflood monitoring and management
- Reservoir performance with waterflooding projects
- Effects of water injection on the recovery factor and reserves

Oil Recovery Enhancement Techniques

- Introduction to enhanced oil recovery techniques
- Conventional and none conventional EOR processes
- Chemical, thermal, and miscible EOR methods
- EOR processes concepts and mechanisms
- Screening criteria guidelines of the EOR processes
- Performance of the EOR processes and expected recovery factors
- Development plans of the EOR processes
- Stages of the EOR projects
- Role of the reservoir management for the application of the EOR processes

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