PetroSkills

Enhanced Oil Recovery Fundamentals - ORE

COURSE

About the Course

One-third to one-half of the original oil-in-place may remain in a reservoir as it reaches abandonment due to its economic limit. The primary reasons are: heterogeneity of the reservoir, unfavorable fluid properties, inefficient nature of the displacement process, oil price, and production cost considerations. The secondary reasons, however, are: inappropriate development, inefficient reservoir management practices, and escalating costs of remedial interventions/corrective measures and producing operations. The oil recovery is generally lower than expected due to some combination of the above reasons. Gaining a better understanding of the reservoir fundamentals and the important variables that influence the recovery process can enhance it.

This course aims to provide such an understanding. It presents the subject material with a clear focus on: developing and producing the reservoir efficiently within its complexity constraints, harnessing energies available within the reservoir-aquifer-injection system, realizing technical benefits and application limitations of the various EOR methods, and selecting the optimum time window. This course covers the recovery improvement possibilities that present themselves at all stages in the reservoir life cycle. It thereby enables one to timely select the most beneficial method and set realistic expectations on production behavior changes and recovery improvement. The impacts of the selected method on personnel training, technology transfer, and facility modification are also covered. The material is presented in simple terms that would enable a participant to understand what works where, what fails when, and why. It is light on theoretical equations, but it scrutinizes these to comprehend importance of significant parameters. It utilizes case studies from projects around the world; their analyses and interpretations aid the participant in understanding of the material. Many illustrative problems, worked in the class by teams, are helpful in gaining a better grasp of the subject matter.

This course covers conventional reservoirs.

"Como son tantos temas es prefeable realizar el curso en dos semanas." - Reservoir Engineer, Colombia

"The course will be very useful in my current role. Historical examples and technology evolution was interesting and helped me to understand the range, area, type of applications. Calculations very useful." - Team Lead, United States

Target Audience

Engineers responsible for sustaining or increasing oil and gas production and enhancing oil recovery from reservoirs under primary depletion, pressure maintenance by water or gas injection, and enhanced oil recovery schemes. Also, other professionals and managers participating in the above effort on a multi-

disciplinary team who need to gain better understanding of the concepts, practices, benefits, and limitations of the various conventional and emerging technologies.

You Will Learn

Participants will learn how to:

- Develop recovery expectations from reservoirs under primary depletion or pressure maintenance utilizing water or immiscible gas injection
- Determine reasons and causes for less than theoretically possible recovery
- Choose appropriate methods (with their target applications, benefits, and limitations) for improving oil recovery from reservoirs under primary depletion or pressure maintenance utilizing water or immiscible gas injection
- Enhance oil recovery beyond waterflooding or immiscible gas injection project
- Understand mechanisms responsible for recovery improvement in various EOR methods
- Use miscible methods: injection of solvents (LPG/NGL injection, gases such as natural gas, carbon dioxide, nitrogen, flue, etc.) in the reservoir
- Use chemical methods: injection of chemicals (polymers, surfactants, caustic soda, etc.) in the reservoir
- Use thermal methods: introduction to heat (hot water, steam, combustion, inter-well, and huff-&-puff) in the reservoir Important variables that control recovery improvement in various EOR methods
- Select EOR methods using screening criteria
- Use designing procedures - theoretical, laboratory tests, and field pilots
- Plan and implement EOR processes employing the proper empirical, analytical, and simulation tools
- Forecast rate-time and recovery-time behavior under various EOR methods and analyze reservoir performance
- Assess risks and ways to minimize their impact on project economics Monitor reservoir/well behavior

Course Content

- Reservoir life cycle and recovery process
- Life under primary recovery phase: recovery targets and ways to improve
- Life under secondary recovery phases: immiscible gas injection, waterflooding, recovery targets, ways to improve
- Life under enhanced oil recovery phase: increasing complexity, cost/benefit consideration
- Miscible methods: selection criteria, recovery targets and why they are seldom met, design considerations, case studies
- Chemical methods: selection criteria, recovery targets and why they are seldom met, design considerations, case studies
- Thermal methods: selection criteria, recovery targets and why they are seldom met, design considerations, case studies
- Technical challenges: current and future R & D directions, facilities modifications and personnel training

Product Details

Categories: Upstream

Disciplines: Reservoir Engineering

Levels: Foundation

Product Type: Course

Formats Available: In-Classroom

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