

Course Code
PE07

Course Title

Management of Mature Oil Fields that Pose a Dilemma

Instructor

Dr. Serhat Akın



Professional Career

Dr. Serhat Akın is professor of Petroleum and Natural Gas Engineering at the Middle East Technical University (METU), Ankara, Turkey. He has served on the faculty since 1998. Prior to joining METU, Dr. Akın was a post-doctoral researcher and Blaustein Visiting Professor in Petroleum Engineering Department, Stanford University in 1996 - 1998 and 2006 respectively. He holds B.Sc., M.Sc. and PhD degrees from METU all in petroleum and natural gas engineering. His research interests include computerized tomography applications, image processing, EOR, reservoir and geothermal engineering. Dr. Akın received the Society of Petroleum Engineers Outstanding Technical Editor award three times in 2001, 2002 and 2004. He is an associate editor of the SPE Reservoir Evaluation and Engineering and an editorial board member in International Journal of Petroleum Science and Technology (IJPS), the Open Petroleum Engineering Journal and Turkish Oil and Gas Journal.

Course Objective and Description

This 5-day course provides a systematic approach for assessing the potential value of mature oil fields that pose a dilemma. Precious resources are expended evaluating and revitalizing such fields. The course is structured around background lectures and field case studies in order to familiarize engineers with real life problems associated with the optimal appraisal, development and operation of mature oil fields, and to provide a basis for management decisions. This course is designed for reservoir and production engineers working in the oil and gas industry. Topics include:

- Pros, cons, and considerations of mature fields
- Re-engineering field data and what to look for in a Data Room
- Geological impact and engineering considerations
- Outline of processes and strategies in approaching a mature field
- Infill Drilling and Enhanced Oil Recovery screening
- Case studies and histories

Who Should Attend

This course is designed for reservoir and production engineers working in the oil and gas industry. It is anticipated that the participants would have at least a B.S. degree, or equivalent, in Petroleum Engineering. However many of the basic techniques used in management of mature oil fields will be described in sufficient detail for participants to obtain an understanding on the fundamentals behind the use of these techniques.

Prerequisite

Basic petroleum engineering and geology knowledge is essential.

Learning Level

Undergraduate to graduate level.

Duration

5 days

Course Material

The course material will consist of hard copies of the power point presentation plus and CD and copies of a number of important and relevant papers that will be discussed in the course.
Management of Mature Oil Fields

Course Outline

Day One

- Definitions and Concepts
 - o Definition and overview of mature fields
 - o Current status
 - o Reserve estimation for mature fields
 - Deterministic model
 - Stochastic model

Day Two

- Volume Calculations (STOIIP)
 - o Reserves estimation – Monte Carlo technique
 - o Reserves estimation – Decline curve analysis

Day Three

- Reservoir characterization & heterogeneity
 - o Estimation of residual oil saturation
 - o Laboratory data and logs
 - o SCAL
 - o Where is the remaining oil?
 - o Micro and macro sweep efficiency
 - o Well logs
 - o Permeability correlations
 - o Naturally fractured reservoirs
- Estimation of recovery factor
 - o Relative permeability models/measuremen
 - o Effect of Wettability

Day Four

- Reservoir improvement
 - o Infill drilling, well spacing, by-passed oil, undrained oil, unswept regions
 - o EOR
 - o Gas injection
 - o Chemical injection
 - o Thermal injections
 - o Infill drilling or EOR?

Day Five

- Management strategies
 - o Different reservoir management approaches
 - o Extreme cases for mature field development:
 - o Short term investments
 - o Long term investments
 - o Case study
 - o Development of mature oil fields with different characteristics

Antalya, Turkey
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