**Abstract:**

With the severe decrease in the possibility of discovering new giant oil fields, mature fields become critically important for meeting future oil demands.  Special attention is required for identifying the proper diagnostic techniques to determine the reason for and the location of the unrecovered oil and prudential development and reservoir management techniques for economically viable re-development applications.

In this presentation, after the definition of a mature oil field, the different aspects of mature field development are outlined.  The first issue covered is the estimation of remaining reserves focusing on the determination of the amount and location of the residual oil after primary and secondary recovery using field, log, and core data.  A comparative analysis of these data collection tools and techniques is then provided.

Next, attention is given to the most widely applied enhanced oil recovery methods in mature fields, primarily chemical and immiscible/miscible gas injection.  Diagnosis of the problem (i.e., the reasons behind why there is unrecovered oil) is a critical step in planning further development actions.  Examples of reservoir characterization and solutions through re-engineering the fields are provided in order to determine what causes the oil to be trapped in the reservoir.  After reviewing mid- and late-stage development options through different enhanced oil recovery methods for different size mature fields, reservoir management strategies for majors, independents, and national oil companies are discussed.  A critical issue to be considered is the microscopic efficiency of tertiary recovery techniques that might be affected by the amount of water remaining from the secondary techniques.  Therefore, it is important to select the right time to switch to the tertiary method to reach the highest possible value of ultimate recovery at the end of the project.

**Biography:**

Dr. Tayfun Babadagli is a professor in the School of Mining and Petroleum Engineering, at the University of Alberta where he holds an NSERC-Industrial Research Chair in “Unconventional Oil Recovery” sponsored by eight national and international companies. He previously served on the faculty at Istanbul Technical University, Turkey, and Sultan Qaboos University, Oman.  Babadagli’s areas of interest include modeling fluid and heat flow in heterogeneous and fractured reservoirs, reservoir characterization through stochastic and fractal methods, optimization of oil/heavy-oil recovery by conventional/unconventional EOR methods and CO2 sequestration. He holds BS and MS degrees from Istanbul Technical University and MS and PhD degrees from the University of Southern California, all in petroleum engineering.

Babadagli has served on several SPE committees and on the technical program committees of numerous SPE conferences and forum series.  He has also provided consultancy services and short courses, and delivered talks to industry, universities and research centers in more than twenty countries.  Babadagli is currently the Executive Editor for SPE Reservoir Evaluation and Engineering (Formation Evaluation part).