



## PRACTICAL RESERVOIR MANAGEMENT AND SURVEILLANCE TECHNIQUES FOR WATERFLOOD PROJECTS

### Workshop Description

Primary and secondary production schemes generally result in recoverable reserves in the range of 10 to 45%. Meeting the recovery target forecast at the time of project development requires the implementation of a reservoir management plan that includes project surveillance at all levels (well, pattern, producing horizon, area, and field), both surface and subsurface. Reserves additions via new discoveries have been declining steadily in the last decades, and the increase of recovery factors from mature oilfields in known basins will be critical to meeting growing market demand. Achieving and improving on recovery factors above the initial forecasts can be accomplished through effective surveillance and the use of new tools and techniques. This workshop will provide participants the opportunity to review and learn the elements of comprehensive reservoir surveillance for waterflooding projects.

In conducting this workshop, the instructors plan to:

- (1) Spend most of the time discussing the practical aspects of project surveillance,
- (2) Discuss the impact of reservoir management and surveillance on the project economics, and
- (3) Provide each course attendee a workbook containing copies of the instructors' PowerPoint presentations

### WORKSHOP CONTENT

Reservoir Management  
Surveillance  
    Philosophy, Methodology, Critical Needs, Desired Accuracy  
    Necessity of Field Measurements and Options  
Critical Aspects to Monitor in Wells and Facilities  
Maximizing Utilization of Conventional Methods  
Reliability and Frequency of Measurements & Sampling  
Data Management & Processing  
Ease of Interpretations and Usage  
Value of Information and Cost Effective Options  
Waterflood Management and Surveillance  
Surveillance Plan Development  
Streamline and Dynamic Reservoir Models as Surveillance Tool  
Well Level Surveillance and Production Well Performance  
Productivity Monitoring, PLT and Productivity Index  
Production Well-Lift Equipment, Well Analysis  
Commingled Production Wells and Injection Wells  
Static and dynamic Pressure Tests, IFO  
Injection Well Performance - Hall plot  
Pattern Analysis and Pattern Performance Optimization  
Tests for Inter-Well Communication  
Group and Field Analysis  
Tracking Pressure, Saturation Depletion and Fluids Movement  
Remediation of Problem Wells  
Surface Production and Injection Equipment  
Quality of Injected Fluids and Well Integrity  
Waterflooding Fractured, Tight and Very Heterogeneous Reservoirs  
Integrating Information in Geological and Reservoir Models  
Identifying Projects as Enhanced oil Recovery (EOR) Candidates  
Specialized Monitoring - 4D Seismic for Sweep  
Detection of Fracture Propagation/ Deformation  
Revitalization of Mature Waterfloods  
Case Studies

## Duration and Scope

This is a five (5) day high-level workshop, which involves discussion of issues related to reservoir surveillance and management techniques. An entire day is devoted to discuss basics of reservoir surveillance including philosophy and methodology of surveillance, and critical aspects of well and facilities monitoring. This is followed by an in-depth presentation of techniques for the surveillance and optimization of oil waterflooding operations. Case histories are included to facilitate the understanding of aspects involved in monitoring these projects. The workshop also includes guidelines for the integration of surveillance data into geological and reservoir models, and discussion about the latest developments in surveillance technology. Several practical classroom problems are included for the workshop attendees to make this a hands-on workshop.

## Who Should Attend

This five (5) day workshop is custom-designed for petroleum engineers, reservoir engineers, production engineers, facilities engineers, managers, and other professionals involved or interested in practical reservoir surveillance and management techniques for waterflood projects.

## Workshop Requirements

Each workshop attendee (student) should bring their own notebook computer to work on the class problems. Class room should be equipped with power strips, for students to plug in their notebook computers, and a projector for instructors to project their PowerPoint slides.

## Workshop Instructors

This custom designed workshop will be conducted by our high-level and seasoned consultants, with extensive knowledge and experience in the subject matter as well as in conducting training programs around the world.

## Workshop Manual

Each workshop attendee will be provided a workbook containing copies of the instructors' PowerPoint presentations, and solutions to the class problems.

## Language of Instructions

This workshop will be conducted in the English language. However, if desired by the client, one of our bi-lingual consultants can be present throughout the workshop for the benefit of those attendees who are not fluent in the English language. This workshop can be customized further to meet the needs of the client's professionals and managers.