Integrated Reservoir Characterization and Modeling

Optimize Your Reservoir Characterization and Modeling With Effective Multidisciplinary Team Integration From Exploration to Production

Date: 05th October - 09th October 2015
Location: Kuala Lumpur, Malaysia

Petrosync Distinguished Lecturer
Hai-Zui Meng, PH.D.
- President of iReservoir.com, Inc.
- Summer SEG D&P Forum Committee Chairman (1996)
- Summer SEG D&P Forum Committee (1995)

Course Objectives
- Differentiate the contributions of a geologist, petrophysicist, geophysicist and reservoir engineer to a reservoir characterization project
- Establish the geological, petrophysical, geophysical and engineering data required to initiate a reservoir characterization project
- Determine which questions need to be answered and thus what tasks performed by each member of an integrated team
- Generate workflows for characterization of a conventional reservoir, tight gas reservoirs, and shale gas or shale oil reservoirs

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If you like to know more about this excellent program, please contact Jerry Tay (Conference Director) on +65 6415 4502 or email jerry.t@petrosync.com
Course Overview

A successful exploration and exploitation project requires efficient use of an integrated, multi-disciplinary team. This training course examines how such a team should be structured, what questions should be asked of each member and what tasks each should perform to deliver the answers. It addresses the different requirements of conventional plays, tight gas plays, and resources plays. Several different field examples will be used, with one public domain data set used as a common characterization theme through all modules.

This course is designed for

- Reservoir Engineer
- Geologist
- Petrophysicist
- Geophysicist
- Petroleum Engineer
- Production Engineer
- Project Engineers
- Project Managers

Hai-Zui (“Hai-Ray”) Meng has over 30 years of experience in the oil and gas industry working in various technical positions. Hai-Ray created iReservoir.com, Inc. to provide integrated reservoir characterization and fluid flow simulation consulting services using state-of-the-art geoscience and engineering technologies. Previously, he was with Marathon Oil Company, Dowell Schlumberger and Flopetrol-Johnston Schlumberger.

Dr. Meng has conducted numerous integrated reservoir characterization, reservoir simulation and reservoir management studies. Dr. Meng has extensive reservoir characterization experience including seismic attribute analysis, 3D faulted structural framework modeling, deterministic and stochastic AI inversion, 3-D geologic model construction, and 'very practical' geostatistical modeling for reservoir engineering problems.

Dr. Meng has also conducted detailed reservoir management studies using both black-oil and compositional fluid flow simulation models that are constrained to honor the existing geological, geophysical, petrophysical, and engineering data. Dr. Meng has served on various Technical Committees for both the SPE and SEG as was author of the chapter "Design of Propped Fracture Treatments" in Schlumberger’s 1987 textbook on Reservoir Stimulation.
Course Agenda

Module 1 - Geology Workflow

Project Questions
What is available?
Are data/tops usable?
Depositional Model?
Sealing faults and other barriers?
Structural, fault, strat maps?
Hierarchy of surfaces established?
Flow units, barriers and baffles?
Facies ready for geomodel?
Aspect ratios and proportionality?
Tight oil and gas reservoirs?

Case Studies and Exercises

Workflow Tasks
Database construction issues
Quality control, define goals
Ensure a fit with regional framework
Validation with dynamic data
Seismic/log interpretation
1-D stratigraphic and facies analysis
2-D correlation and facies analysis
Facies proportion curves
Depositional model
Specialty tasks, natural fractures

Module 2 - Petrophysics Workflow

Project Questions
What is available?
Are logs consistent?
Conventional analysis vs. model?
What is the net pay?
Does it matter?
Additional engineering needs?
What does the seismic tell us?
Tight oil and gas reservoirs?

Case Studies and Exercises

Workflow Tasks
Database review: SCAL, Logs
Quality control: Edits, Reprocessing
Log normalization
Petrophysical analysis
Net pay identification, why
Facies units or flow units
BVW, contacts, Phi-K
Rock physics/petrophysics relations
Specialty tasks: TRA, Fracability

Module 3 - Geophysics Workflow

Project Questions
What is available?
Is it ready to use?
What minerals and fluids?
What does seismic tell us?
Faults and horizons?
Rock types, facies, faults?
Time-depth conversion?
AVO inversions?
Lithology, fluids and fractures?
Tight oil and gas reservoirs?

Case Studies and Exercises

Workflow Tasks
Pre-stack, post-stack data review
Quality control
Petrophysical analysis
Rock physics check
Structural interpretation
Attribute extraction and analysis
Velocity modeling
Constrain geomodeling
PreStack & Multi-component Attrib.
Specialty tasks, Special data types
Course Agenda

Module 4 - Geomodelling Workflow

Project Questions
What is available?
Are data / tops consistent?
What is required model resolution?
Depositional environment variables?
Are facies proportions available?
Seismic-log calibration available?
Porosity and permeability relationships?
Net pay cutoff?
Reservoir simulation grid requirements?
Tight oil and gas reservoirs?

Workflow Tasks
Database review
Horizon / fault surface construction
3-D stratigraphic grid construction
Spatial statistics analysis
Facies distribution
Modeling seismic/petro relationships
Distribution of Phi-K cloud
Net-to-gross estimation
3-D Stratigraphic grid upscaling
Specialty tasks, natural fractures

Case Studies and Exercises

Module 5 - Engineering Workflow

Project Questions
Fluid types?
SCAL data (by facies)
Well tests (PTT, tracer, RFT, PLT)?
Well completions, rates, and pressures?
Effective Kv, fault sealing?
Aquifer size and strength?
History matching?
Forecasts (uncertainty, optimization)?
Tight oil and gas reservoirs?

Workflow Tasks
PVT fluid models for simulation
Kr, Pc, compaction behavior
Geomodeling/simulation calibration
Analyze, QC, prep for simulation
Test impact on simulations
Test impact on simulations
Dynamic calibration
Simulation sensitivities, economics
Specialty tasks

Case Studies and Exercises

Module 6 - Specialty Workflow Tasks for Resource Plays

Project Questions
Geology?
GeoChem?
Petrophysics?
Rock Physics?
Geophysics?
Drilling, Completions?
Reservoir Eng.?
Economics?

Workflow Tasks
Depositional geo-control, analogs
Maturity uncertainty, compartments
Free and adsorbed gas estimation
Seismic calibration, rock mechanics
Sweet spot, Microseismic calibration
Vertical vs Horizontals, frac-stages
EUR, Decline Behavior, Spacing
Risk models, project optimization

Case Studies and Exercises

PROGRAM SCHEDULE

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>08:00 – 09:00</td>
<td>Registration (Day 1)</td>
</tr>
<tr>
<td>09:00 – 11:00</td>
<td>Session I</td>
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<tr>
<td>11:00 – 11:15</td>
<td>Refreshment &amp; Networking Session I</td>
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<tr>
<td>11:15 – 13:00</td>
<td>Session II</td>
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<tr>
<td>13:00 – 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:00 – 15:30</td>
<td>Session III</td>
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<tr>
<td>15:30 – 15:45</td>
<td>Refreshment &amp; Networking Session II</td>
</tr>
<tr>
<td>15:45 – 17:00</td>
<td>Session IV</td>
</tr>
<tr>
<td>17:00</td>
<td>End of Day</td>
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Course Details
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Location: Kuala Lumpur, Malaysia

INVESTMENT PACKAGES
Please circle the package that you are attending!

<table>
<thead>
<tr>
<th>Investment Package</th>
<th>Deadline</th>
<th>5 DAYS MASTERCLASS</th>
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<tbody>
<tr>
<td>Standard Price</td>
<td>2nd Oct 2015</td>
<td>SGD $ 5,995</td>
</tr>
<tr>
<td>Early Bird Offer</td>
<td>4th Sept 2015</td>
<td>SGD $ 5,795</td>
</tr>
<tr>
<td>Group Discount (3 or more Delegates)</td>
<td>2nd Oct 2015</td>
<td>10% discount for groups of 3 registering from the same organization at the same time</td>
</tr>
</tbody>
</table>

* To enjoy the promotion & discount offer, payment must be made before deadline
* For 5 or more delegates, please inquire for more attractive package.
* Prices include lunches, refreshments and materials. Promotion & discount cannot be combined with other promotional offers.
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