Mork Family Department of Chemical Engineering and Materials Science

Introduction to Reservoir Monitoring Consortium

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RMC Inaugural Meeting

September 14, 2011
Goals of the Inaugural Meeting

- Introduce RMC and its Objectives
- Provide necessary details about the Project Portfolio
- Receive feedback from the industry on
  - Projects of the highest impact
  - How we can complement the work inside oil companies
  - How we can complement the ongoing R&D work in the service companies
- Start the process for project ranking
- Start the process of forming the Strategic and Technical Advisory Board
- Determine what it will take to get commitment from companies for Base Funding
Why RMC?

- Identify the current key technology gaps
- Focus on interfaces between different disciplines
- Integrate data, information, expertise and workflows
- Maintain a balance between the short term high impact research and long term needs
- Develop dynamic reservoir monitoring (DRM) workflow
- DRM for different reservoir types:
  - Conventional,
  - Shale,
  - Deep water,
  - Carbonate,
  - Mature,
  - HP/HT
Selected Faculty / Expertise

- Integrated Reservoir Simulation
- Signal Processing / Pattern Recognition
- Fuzzy Logic / Neural Networks / GA
- 4D Geophysics / Passive Seismic
- Reservoir Characterization
- Petrophysics
- Sensors (compressed sensing)
- Nano Technology . Systems / Control
- Physical Modeling
Consortium at a Glance

Sponsors

USC

Strategic Advisory Board

Technical Advisory Board

Problems

Tools

Convectional Signal Processing

Carbonate 4D Geophysics

Shale gas Nano Technology

HP/HT Cloud Comp./HPQ

Deep water Borehole Sensors

Fractured NN/FL/ GI/ PR/AI

Heavy Oil New Sensors

Mature fields
Project Portfolio

Need for integration

RMC at a glance

Interpretation & optimization

Reservoir description & monitoring Tools

Data acquisition & management

Integrated Reservoir Management

MEQ & Seismic Integration for Shale Reservoirs

Optimize Hydraulic fracturing for shale

MEQ to map Reservoir Structure

Inverse Modeling for RM

Feature-Based Reservoir Characterization

Physical Models to monitor reservoir fluid

Reservoir Continuity

Numerical Model Perturbations for RM

Fractured Reservoir Modeling

Nano-Particles to probe / monitor reservoir

Time lapse Petrophysics for RM

Up-scaling for compositional simulation - EOR

Electromagnetics for RM

Data Management for RM

Underwater Acoustic Communication

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Data Management for RM

Underwater Acoustic Communication
Project Portfolio Prioritization

Much like Prospect Ranking or CAPEX Allocation
Project Funding

Proposed Project Portfolio

PPP₁, PPP₂, …PPPₘ

Selected Portfolio with group ranking (Base Funding)

B₁, B₂, ………..Bₙ

High ranked projects by Individual Companies

IC₁, IC₂, ………..ICₘ
Brain Storming & Panel Discussion

- Brain Storming Sessions
  - What are the key practical challenges on RM
  - What are the important tools with most promise for RM
  - How to set priorities and the metrics to use for project ranking

- Brain Storming Sessions
  - How RMC should evolve?
  - Where do we go from here?