

SPE2019

Sept 30 – Oct 2 | Calgary, Alberta

BOOTH
819


EMERSON

Society of Petroleum Engineers Annual Technical Conference & Exhibition

September 30 - October 2, 2019 | Calgary, Alberta, Canada - Booth **#819**

Presentation Schedule

Monday, Sep. 30	Title	Featured Technologies
9:00 AM	Using Machine Learning to Successfully Predict Facies Distribution in a Permian Basin Dataset	SeisEarth™ + Machine Learning Solutions
10:00 AM	Reducing Expenditures and Improving Production Data Acquisition at the Well Pad Using Multiphase Flow Metering	Roxar™ Multiphase Flow Meter MPFM 2600 MVG
11:30 AM	Big Loop - A Collaborative Approach to Calibrating Subsurface Models for Reliable Production Concept Design and Forecasting	Big Loop™
12:00 PM	Lunch and Learn: Improving Heavy Oil Modeling & SAGD-Able Volume Calculations	Roxar RMS™ and SKUA-GOCAD™
1:00 PM	Integrated Well Engineering Leveraging Petrophysics, Geomechanics and Production Engineering	Geolog™
3:15 PM	Leveraging IIoT, Cloud, and Machine Learning to Facilitate Next-generation Production Optimization	Paradigm k™
Tuesday, Oct. 1	Title	Featured Technologies
9:00 AM	Big Loop - A Collaborative Approach to Calibrating Subsurface Models for Reliable Production Concept Design and Forecasting	Big Loop™
10:00 AM	Reducing Expenditures and Improving Production Data Acquisition at the Well Pad Using Multiphase Flow Metering	Roxar™ Multiphase Flow Meter MPFM 2600 MVG
11:30 AM	An Innovative Approach to Determining Initial Fluid Composition by Tuning an Equation of State to Experimental Data	Tempest™
12:00 PM	Lunch and Learn: Leveraging IIoT, Cloud, and Machine Learning to Facilitate Next-generation Production Optimization	Paradigm k™
1:00 PM	Using Machine Learning to Successfully Predict Facies Distribution in a Permian Basin Dataset	SeisEarth™ + Machine Learning Solutions
3:15 PM	Improving Heavy Oil Modeling & SAGD-Able Volume Calculations	Roxar RMS™ and SKUA-GOCAD™
Wednesday, Oct. 2	Title	Featured Technologies
9:00 AM	Leveraging IIoT, Cloud, and Machine Learning to Facilitate Next-generation Production Optimization	Paradigm k™
10:00 AM	Reducing Expenditures and Improving Production Data Acquisition at the Well Pad Using Multiphase Flow Metering	Roxar™ Multiphase Flow Meter MPFM 2600 MVG
11:30 AM	Integrated Well Engineering Leveraging Petrophysics, Geomechanics, and Production Engineering	Geolog™
12:00 PM	Lunch and Learn: Big Loop - A Collaborative Approach to Calibrating Subsurface Models for Reliable Production Concept Design and Forecasting	Big Loop™
1:00 PM	An Innovative Approach to Determining Initial Fluid Composition by Tuning an Equation of State to Experimental Data	Tempest™

Abstracts

Using Machine Learning to Successfully Predict Facies Distribution in a Permian Basin Dataset

Monday, 9:00 am; Tuesday 1:00 pm

Presented by Dennis Ellison

One of the leading challenges in hydrocarbon E&P is predicting rock types and fluid content distribution throughout the reservoir away from the boreholes. Spatial determination of the lateral and vertical heterogeneities has a direct impact on reservoir models because it affects property distributions. In this presentation, we demonstrate the application of a machine learning methodology, Democratic Neural Network Association (DNNA), to the problem of finding oil-filled packstones in the Middle Wolfcamp, Eastern Shelf of the Permian Basin, Texas. The DNNA method was trained using lithology logs from wells simultaneously with poststack and prestack seismic data. This technique uses a probabilistic approach to find patterns in seismic that will predict lithology distribution and uncertainty.

Featured technologies: SeisEarth™ + Machine Learning Solutions

An Innovative Approach to Determining Initial Fluid Composition by Tuning an Equation of State to Experimental Data

Tuesday, 11:30 am; Wednesday 1:00 pm

Presented by Usman Aslam

Equation of State requires calibrating to the measured laboratory data to accurately predict reservoir fluid phase-behavior under varying pressure and temperature. The typical regression techniques used during such a calibration process ignore the inherent uncertainty in the PVT properties. We present an innovative approach to systematically quantify uncertainty in PVT properties. Our proposed approach not only alleviates the tedious process of regression parameter selection, but also leads to the identification of multiple calibrated models. The success of this technique is demonstrated through its application to a PVT model based on a fluid sample obtained from an oil field in the Gulf of Mexico.

Featured technology: Tempest™

Improving Heavy Oil Modeling & SAGD-Able Volume Calculations

Monday, 12:00 - Lunch and Learn; Tuesday, 3:15 pm

Presented by Sasan Ghanbari

The majority of the heavy oil deposits in the Athabasca oil sands is found within fluvial-estuarine channel point bar deposits of the Lower Cretaceous McMurray Formation. Less than 4% of reserves up to 75 meters deep are shallow enough to mine; the rest require SAGD (Steam Assisted Gravity Drainage). SAGD involves horizontal drilling of an injector and producer pair, about 5m above each other. Horizontal shale barriers have the worst effect on SAGD because they can seal some parts of the reservoir and greatly hinder steam chamber growth. We improve the SAGD reservoir model by incorporating all data types, and effective property and water saturation modeling by integrating trends. Attention to input data and its details are the key to building a suitable model. The main objective is to identify areas suitable to SAGD to place pads and well pairs over a specific geological area, to deliver best production results.

Featured technologies: Roxar RMS™ and SKUA-GOCAD™

Big Loop - A Collaborative Approach to Calibrating Subsurface Models for Reliable Production Concept Design and Forecasting

Monday, 11:30 am; Tuesday, 9:00 am; Wednesday, 12:00 - Lunch and Learn

Presented by Sasan Ghanbari

Big Loop is an automated ensemble-based workflow that tightly integrates the static and dynamic domains. It enables asset teams to capture uncertainties at every stage of the modeling workflow,

allowing them to understand the impact of these uncertainties on the decision-making process. Big Loop employs state-of-the-art machine learning algorithms to produce geologically consistent ensembles of history matched models calibrated to production and optionally 4D seismic data. These ensembles can be reliably used to forecast production performance from oil and gas fields. Being repeatable and updatable, the Big Loop workflow enables the incorporation of data acquired after the model is built and history matched.

This presentation will discuss:

- Capture, propagation and analysis of uncertainty from seismic to simulation
- Collaboration and integration across domains
- The building of 'fit-for-purpose' models
- Significantly reduced cycle times
- Fast updating of geological and reservoir simulation models, leading to a more accurate reservoir description, a more robust estimation of STOIP and reserves uncertainty, and better-informed decisions relating to future development scenarios

Featured technology: Big Loop™

Integrated Well Engineering Leveraging Petrophysics, Geomechanics and Production Engineering

Monday, 1:00 pm; Wednesday, 11:30 am

Presented by Pat Stirling

This presentation presents an Emerson E&P Software suite of modules that offers high-quality functionality to engineers working on wells that are already deep in the production phase.

An integrated workflow will be presented that covers:

- Well integrity functionality, for assessing the mechanical condition of casing in a wellbore
- Well schematic functionality, for visualizing wellbore mechanicals in conjunction with all other data gathered from the wellbore
- Production log interpretation, for enhanced interpretation and understanding of the producing reservoir by working with this data directly alongside open hole datasets.

Featured technology: Geolog™

Leveraging IIoT, Cloud, and Machine Learning to Facilitate Next-generation Production Optimization

Monday, 3:15 pm; Tuesday 12:00 - Lunch and Learn; Wednesday, 9:00 am

Presented by Matt Williams

This presentation discusses the complexities and challenges associated with real-time production engineering and optimization. Challenges addressed include modeling complex fracture systems, completion design and optimization, gas lift planning and optimization, and virtual metering. The enabling technologies behind this workflow are also discussed. These include a fully cloud-native deployment, IIoT integration, a novel hybrid simulation engine, and machine learning history matching to enable predictive production profiles.

Featured technology: Paradigm k™

Reducing Expenditures and Improving Production Data Acquisition at the Well Pad Using Multiphase Flow Metering

Monday, 10:00 am; Tuesday, 10:00 am; Wednesday, 10:00 am

Presented by Paul Jobe

Learn how the Roxar Multiphase Flow Meter MPFM 2600 MVG is allowing operators in the North America Unconventional Shale Plays to improve reservoir management through efficient production data acquisition, and to reduce CAPEX and OPEX at the well pad.

Featured technology: Roxar™ Multiphase Flow Meter MPFM 2600 MVG