

TRAINING COURSE

APPLIED CHEMICAL ENHANCED OIL RECOVERY

4 Day Course

Day 1: Mechanistics of CEOR

Day 2: Project Design

Day 3: Field Application

Day 4: Panel + Laboratory Tour

September 23-26, 2014

Held at

THE GOLDEN HOTEL

800 Eleventh Street

Golden, Colorado 80401

Who Should Attend?

- Managers
- Engineers
- Geologists
- Technicians

Fees + Registration

Before August 1 \$2,500

After August 1 \$3,500

Register online at www.surtek.com

or send in a registration form to
surtek@surtek.com

Course Description

This course not only describes the mechanisms involved in the chemical enhanced oil recovery (CEOR) process but details the planning/design stages of implementation and the benefits/challenges thereof.

Participants will learn:

- Oil recovery equation efficiencies
- Alkali, surfactant and polymer properties
- CEOR reservoir screening
- Laboratory process for formulation design
- CEOR numerical simulation and economics
- Pilot planning/design
- Facility design and requirements
- QC/QA for field implementation
- CEOR key challenges and ways to avoid/mitigate
- Case studies (successes and failures)

Since 1978 Surtek has been assisting companies understand the CEOR process through consulting, training and project design. Our course is based on more than 30 years of experience and more than 70 field applications. Surtek is the principal developer of the ASP process and invites you to come learn from the source.

Course Instructors

Kon Wyatt has worked for Surtek in various capacities since 1980 as Chemist, Laboratory Manager, Project Engineer, and as Vice-President of Engineering. He holds a B.Sc. in Chemistry from Lewis and Clark College and a M.Sc. in Applied Mechanics from the Colorado School of Mines.

Elio Dean has been with Surtek since 2011 as a reservoir engineer focused on field development design. Prior to Surtek Elio worked with ExxonMobil Development Company as a senior reservoir engineer. Elio holds a B.Sc. in Petroleum Engineering and a M.Sc. in Energy Economics both from Colorado School of Mines.

SPE IOR Pioneer award recipients **Harry Surkalo** and **Dr. Malcolm Pitts** will assist in the course along with Surtek's laboratory directors **Dan Wilson** and **Jie Qi**.

SURTEK

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1511 Washington Ave.

(303) 278-0877
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TRAINING COURSE AGENDA

APPLIED CHEMICAL ENHANCED OIL RECOVERY

Day 1: Mechanistics of CEOR

Introduction

- Surtek: Who we are
- CEOR History and Potential

Oil Recovery Basics

- IOR/EOR Techniques
- Oil Recovery Equation
- Chemical Flood Steps

Pore Displacement Efficiency

- Capillarity & Wettability
- Capillary Number Correlation
- Alkaline Agents
- Surfactants
- IFT + Relative Permeability

Volumetric Sweep Efficiency

- Mobility Ratio + Fractional Flow
- Polymer Basics
- Polymer Characteristics
 - Molecular Weight
 - Charge
 - Water Solubility
- Polymer Stability
 - Chemical Degradation
 - Thermal Degradation
 - Mechanical Degradation
- Inaccessible pore volume
- Adsorption / retention
- Polymer Gels

Total Recovery Efficiency

- ASP

Day 2: Project Design

Reservoir Screening

- Screening Parameters
- Process and Objectives

Laboratory Studies

- Fluid Analysis
- Fluid-Fluid Evaluation
 - IFT and Phase Behavior
 - Produced Water Dilution
 - Apparent Viscosity and
- Screen Factor
 - Hydrodynamic Volume
- Fluid-Rock Design
 - Static Adsorption
 - Linear Corefloods
 - Oil Recovery Corefloods
 - Radial Corefloods
- Other Laboratory Considerations

Numerical Simulation

- Simulator Options
- Reservoir Characterization
- Model Calibration
 - History Matching
 - Laboratory/Corefloods
- CEOR Forecast Studies
- Effective Pore Volume

Economics

- CEOR Costs
- Project Economics
- Timing

Pilots

- Objectives
- Pilot Planning
- Pilot Pattern Consideration

Day 3: Chemical Flood Application

Facilities

- Water Treatment Methods
- Water Softening Methods
- Chemical Storage and Mixing
- Facility Photo Tour

QC/QA & Monitoring

- Sampling Points and Methods
- Filter Ratio and Sample Tests
- Trouble Shooting

CEOR Concerns

- Scales
- Produced Fluid Emulsions
- Polymer Degradations
- Corrosion

Case Studies

- 3-4 Failed Projects
- 10-15 Successful Projects

Day 4: Overview / Discussions

Review

Laboratory Tour

Panel Discussion / Questions

- 5 Person Panel open to questions and discussions
 - Harry Surkalo (CEOR since '62)
 - Malcolm Pitts (CEOR since '80)
 - Kon Wyatt (CEOR since '80)
 - Dan Wilson (CEOR since '92)
 - Jie Qi (CEOR since '93)

Concluding Remarks

Individual Discussions

- The Surtek team will remain after the concluding remarks for one on one discussion opportunities



TRAINING COURSE REGISTRATION FORM

APPLIED CHEMICAL ENHANCED OIL RECOVERY

PERSONAL DETAILS

Surname:		First Name:	
Suffix:		Gender:	Male <input type="checkbox"/> Female <input type="checkbox"/>
Address:			
City:	Country:	Postal Code:	
Telephone:		Email:	

BUSINESS DETAILS

Job Title/Profession:			
Employer:			
Address:			
City:	Country:	Postal Code:	
Telephone:		Email:	

How did you hear about this training course?	Website <input type="checkbox"/>	Word of Mouth <input type="checkbox"/>	Other <input type="checkbox"/>
What do you hope to gain from attending this training course?			
Do you have any special dietary requirements? Please specify:			
Do you have any disabilities that we should be aware of, so that reasonable adjustments may be made?			

TRAINING COURSE - CREDIT CARD AUTHORIZATION FORM

APPLIED CHEMICAL ENHANCED OIL RECOVERY

Today's date: _____ / _____ / _____

I: _____

- As the Individual card holder, I hereby authorize this card to be used for the payment required.
- As the company representative, I hereby authorize this card to be used for the payment required.

Credit Card Information:

Name as it appears on the Card:

Type of Card: VISA MASTERCARD DISCOVER AMERICAN EXPRESS

Credit Card Number _____ Expiration Date _____ / _____

Security Code BACK of Visa OR Master Card: (3 digits) _____

Security Code FRONT of Amex Card: (4 digits) _____

Credit Card Billing Address: Street: _____

City: _____ State: _____ Zip Code: _____

Telephone: _____

Cardholder or Company Representatives Signature: _____

Date: _____ / _____ / _____

- I hereby authorize this card to be used for the future deposits and/or final payment.

Please sign again for future authorization: _____

This Authorization can be faxed to 303-278-2245 or Emailed to accounting@surtek.com

SURTEK

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