

Water Flooding Management

Improve your Water Flooding Management Knowledge from the Expert !

Course Level : Basic - Intermediate

20th - 24th November 2023 at Kuala Lumpur, Malaysia



Petrosync Distinguished Instructor

Magdi El Naggar

Managing Director

Oil Fields Global Consultants (OFGC)

- ▶ Officially Certified as Professional Petroleum Engineering Consultant (License 116/7).
- ▶ Technical Advisor for several companies in the Middle & Far Easts, Africa and Gulf countries.
- ▶ 46 years of professional experience in various phases of Petroleum/Reservoir/Production/Drilling & Workover Engineering and field operations with several multi-national international companies including ARAMCO (Saudi Arabia) and ADCO (UAE).
- ▶ Professional in all phases of well intervention operations utilizing coiled tubing and well control as well as extended reach operations.

A lot of
Practical Things,
Case Studies
and Exercises!

Course Objectives

- ▶ Apply and gain in-depth knowledge on water injection technology and determine the water flooding process as a major method of Enhanced Oil Recovery (EOR).
- ▶ Familiarize with the water injection actual field operations.
- ▶ Understand the relation between water injection & reservoir pressure maintenance.
- ▶ Introduce the basic knowledge of the operating fundamentals of the system.
- ▶ Acquire a fundamental knowledge of the water injection well construction.
- ▶ Understand the basic water injection quality control and monitoring.
- ▶ Gain experience in the system problems and troubleshooting.
- ▶ Understand what are the factors affecting successful institution of waterflooding.
- ▶ Understand how to design, predict and monitor waterflooding.
- ▶ Learn various diagnostics & quantitative techniques of waterflood surveillance and balancing.
- ▶ Learn special considerations of waterflooding remediation of excessive water production shutoff, improving sweep efficiency, polymer augmented waterflood, low salinity) waterflood and reservoir souring.
- ▶ Distinguish the influence of the reservoir and fluid characteristics on injection process and determine the relation between reservoir engineering data and injected water (displacement).
- ▶ Demonstrate understanding of the principals involved in pressure maintenance & oil displacement by an injected fluid.
- ▶ Explain the functions of water injection systems through filters and deaeration and identify the various types of filters.
- ▶ Detail the different qualities of seawater corrosion and distinguish the relationship of microbiological growth and corrosion in line with the structure and growth of diatoms, bacteria and algae.
- ▶ Apply the several tests used to evaluate water quality including process of collecting samples, transport of samples and test frequencies for particle counts.
- ▶ Discuss the thermal methods of EOR including hot water and steam injection and get important tips of the polymer injection process.

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Course Overview

This course is designed to ensure effective understanding of the water flooding (injection) system as one of the reservoir secondary methods of oil recovery and maintain the reservoir pressure with special attention to the system components from the supply source to injection point in the reservoir. It involves injecting clean, non-corrosive water into the reservoir to displace the remaining oil. This training course is primarily on the mechanics of oil recovery by water flooding. The aim of this course is to provide the participants with a complete and up-to-date overview of the water flooding. Upon successful completion of this training course, participants should have a solid grounding in understanding the purpose, operation and inspection of water injection systems for enhanced oil recovery. The training course will also illustrate potential problems and solutions.

The course is composed as modules, which include exercises, group discussions and quizzes for full comprehension of the course topics relevant to all functions of the water injection system and its operations.

Who Should Attend?

- ▶ Operations Engineers with 0-10 Years Experience
- ▶ Operations Supervisors with 0-10 Years Experience
- ▶ Production Engineers with 0-10 Years Experience
- ▶ Petroleum Engineers with 0-10 Years Experience
- ▶ Reservoir Engineers with 0-10 Years Experience
- ▶ Field Services Engineers with 0-10 Years Experience

Training Methods

The training will include full explanation of the modules with detailed practical information along with practical video clips for actual field cases. It also includes group discussions, actual field case studies and daily quizzes to keep the information live in addition to pre & post course tests to evaluate the learning process. The course will further include hands on training at the field on actual water injection system equipment.

PROGRAM SCHEDULE

08:00
 08:10 – 10:00
 10:00 – 10:15
 10:15 – 12:30
 12:30 – 13:30
 13:30 – 15:00
 15:00 – 15:15
 15:15 – 16:00
 16:00

**Schedule may vary for each training*

HYBRID TRAINING SOLUTIONS

FOCUS TRAINING • REDUCE COST • ENHANCED RESULTS

Over the years, there has been a growing demand for hybrid training programs. It is an excellent option to maximize your training dollar for your specific training needs. We make it possible to run a training program that is customized totally to your training needs at a fraction of an in-house budget!

If you like to know more about this excellent program, please contact us on +65 3159 0800 or email general@petrosync.com

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Course Agenda

Day 1

Pre-Course Test

Module 1 : Reservoirs and Rock Properties

- Definition of Reservoir
- Reservoir Characteristics (Porosity, Permeability, Reservoir Pressure, Reservoir Temperature, Formation Damage, etc)
- Factors affecting Reservoir Flow
- Super-Saturated Reservoir
- Reservoir rock properties
- Reservoir fluids properties
- Factors affecting water flooding

Module 2 : Introduction to Water Injection

- Definition of Water Injection
- Reasons for Water Injection
- Reservoir Drive Mechanisms

Module 3: Waterflooding

- Waterflooding definition, concept and objective
- Water flooding Vs. Water injection
- Types of waterflood patterns
- Sources of injection water
- Factors affect water flow process
- Waterflooding advantages

Case Study:

Water injection patterns

Aquifer water Vs. seawater

Injection water quality control

Day 2

Quizzes & recap

Module 4: Water Injection Systems

- Main components of a water injection system
- Types of pumps in water injection system
- Purpose of pumps
- Filtration of water
- Purpose of injection well manifolds

Case Study:

Water injection system components

Y-tool applications in water injection system

Selection criteria of the water injection system

Module 5: Screening for Water Flooding

- Drive Mechanism
- Reserves estimate and remaining reserves
- Reasons for waterflooding
- Secondary recovery and pressure maintenance concept
- Reservoir engineering aspects and screening for water flooding
- Water injection systems
- Water source: produced water, aquifer water, seawater

- Basic water treatment
- Basic seawater treatment
- Filtration & deaeration

Group discussion and exercises

Day 3

Quizzes & recap

Module 6: Design Aspects of Water Injection Well System

- Reservoir considerations
- Immiscible displacement theory
- Water injection wells construction
- Basic well completion
- Types of water injection wells
- Operating parameters of wells
- Water flood performance efficiency
- Water flood design
- Candidate, pattern and factors affecting pattern selection and well spacing
- Water flood production performance and reservoir forecast
- Factors influencing water flood recovery
- Water flood monitoring

Group discussion and exercises

Module 7: Water Flooding Quality & Monitoring

- Quality & monitoring
- Corrosion problems (reasons and solutions)
- Field operations, water system compatibility and treatment
- Introduction to chemical enhanced oil recovery techniques
- Polymer flooding

Group discussion and recap

Day 4

Quizzes & recap

Module 8: Enhanced Oil Recovery (EOR) Applications

- Surfactant flooding
- Alkaline flooding
- Hot water flooding
- Steam injection
- Water flood project optimization and economic evaluation
- Field examples and case hist

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Module 9: Injection Water Impurities

- Water supply sources for injection water
- Aquifer water, impurities and quality control
- Seawater, impurities and quality control
- Scaling problem
- Fill accumulation problem
- Importance of water source compatibility

Group discussion and exercises

Module 10: Water Treatment

- Types of produced water
- Aquifer water treatment
- De-oxygenation
- Reasons for treating injection water
- Subsea water injection treatment
- Biological activities of bacterial colonies
- Types of bacteria causes reservoir souring and process mechanism

Case Study:

3 case studies by participants

Day 5

Module 11: Water Quality Monitoring

- Requirement for water quality monitoring
- Principle of particle size analysis
- Turbidity
- Different types of testing methods

Module 12: Operations of the Water Injection System

- Water injection methodologies
- Key operating parameters of the water injection system
- Water performance calculation (Injection water volume calculations)

Module 13: Reservoir Souring

- Mechanisms of souring
 - ▶ Sulphate Reducing Bacteria
 - ▶ Reduction of SRB Protection by Bisulphite
 - ▶ Chemicals
 - ▶ Thermal Sulphate Reduction
 - ▶ Mineral Solubility
- Partitioning of H₂S
- Reservoir souring reasons
- Types of bacteria causing reservoir souring
- Factors influencing reservoir souring process
- Impact of souring on reservoir performance
- Factors affecting reservoir souring
- Reservoir souring treatment process and techniques
- Mitigation
 - ▶ H₂S Scavengers
 - ▶ Biocide Treatments
 - ▶ Nitrate Treatments
 - ▶ Sulphate Removal from Injection Water
- Reservoir Souring Prediction
 - ▶ Modelling Capabilities
 - ▶ Uncertainties

Post-course Test



WHY YOU SHOULD ATTEND PETROSYNC'S EVENTS

- To ensure that all objectives of the course matches yours, all PetroSync programs are developed after intensive and extensive research within the industry
- PetroSync programs focus on your immediate working issues to ensure that you are able to apply and deliver immediate results in real work situations
- Application and implementation of industry knowledge and experience are the drivers for our course design, not theoretical academic lectures
- PetroSync training focuses on practical interactive learning tools and techniques including case studies, group discussions, scenarios, simulations, practical exercises and knowledge assessments during the course. Invest a small amount of your time to prepare before attending the course to ensure maximum learning
- PetroSync follows a rigorous selection process to ensure that all expert trainers have first-hand, up-to-date and practical knowledge and are leaders of their respective industrial discipline

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He has extensive professional experiences in all phases of well intervention operations including coiled tubing, especially during well emergency cases, well control and extended reach operations.

He specialized in well intervention operations, especially, during emergency cases and well blowouts. He also has extensive experiences in full field development studies, Production Enhancement for oil fields as well as various types of wells, CO₂ Injection and EOR operations, IWCF & IADC certification.

Publications

- ▶ Coiled Tubing Operations Standard Procedures
- ▶ Production Engineering Operations Standard Procedures
- ▶ Recently, completed a total of 3,000 research papers in various topics of O & G industry since 2014

Partial Client List

- | | |
|-----------------------------------|-------------------------|
| ▶ SHELL | ▶ OGS (Egypt) |
| ▶ TOTAL (Indonesia) | ▶ APEX |
| ▶ Schlumbergers (Iraq) | ▶ Petromentor (China) |
| ▶ EXXON - ARAMCO | ▶ CNPCIC (China) |
| ▶ ADCO | ▶ Oman Gas |
| ▶ Murphy | ▶ Oman Petrogas |
| ▶ Sapura (Malaysia) | ▶ Sohar Aluminum (Oman) |
| ▶ Arabian Gulf | ▶ Petrofac |
| ▶ GUPCO (Egypt) | ▶ OXY (Oman) |
| ▶ ARAMCO | ▶ Talisman |
| ▶ Osterreichische Mineralol (OMV) | |

Major Related Project

- ▶ Full fields development studies and planning
- ▶ Surface and subsurface integrated system design
- ▶ Water injection system design
- ▶ ESP selection & performance monitoring
- ▶ Injection water quality control and monitoring
- ▶ Injection water treatment management

COURSE DETAILS

Title : Water Flooding Management
Date : 20th - 24th November 2023
Location : Kuala Lumpur, Malaysia

INVESTMENT PACKAGES

Please checklist the package that you are attending!

Water Flooding Management SCHEDULE	LOCATION	PRICE
<input type="checkbox"/> 20 th - 24 th November 2023	Kuala Lumpur, Malaysia	USD 4,195

* All prices are subject to change without notice and are not guaranteed, except that prices for an order that have been accepted by PetroSync is not subject to change after acceptance

* Price is nett excluding Withholding Tax if any and will be quoted separately. Please send us the withholding tax payment receipt.

DELEGATE DETAILS

1st Delegate Name _____ Mr Mrs Ms Dr Others

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

2nd Delegate Name _____ Mr Mrs Ms Dr Others

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

3rd Delegate Name _____ Mr Mrs Ms Dr Others

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

*Please fill all the details including mobile number. This help us to contact participant if they are late in class or if there is any urgent update (through whatsapp/call)

INVOICE DETAILS

Attention Invoice to: _____

Direct Line Number: _____ Fax: _____

Company: _____ Industry: _____

Address: _____ Postcode: _____

Country: _____ Email: _____

Please note:

- Indicate if you have already registered by Phone Fax Email Web

- If you have not received an acknowledgement before the training, please call us to confirm your booking.

PAYMENT METHODS

By Credit Card

By Direct Transfer : Please quote invoice number(s) on remittance advice

PetroSync Global Pte Ltd Bank details:

Account Name : PetroSync Global Pte Ltd

Bank Name : DBS Bank Ltd

Bank Code : 7171 • Bank Swift Code : DBSSSGSXXX • Branch code : 288

Account No : 0288-002682-01-6-022 (USD)

Bank Address : 12 Marina Boulevard, Level 3. Marina Bay Financial Centre Tower 3. Singapore 018982

All bank charges to be borne by payer. Please ensure that PetroSync Global Pte Ltd receives the full invoiced amount.

COURSE CONFIRMATION

I agree to PetroSync's terms & conditions, payment terms and cancellation policy.

Signature : _____

Date : _____

Payment Terms : Payment is due in full at the time of registration. Full payment is mandatory for event attendance.

PROGRAMME CONSULTANT

Name : Cay Aagen
Email : registration@petrosync.com
Phone : +65 3159 0800
Fax : +65 6826 4322

TERMS AND CONDITIONS

DISCLAIMER

Please note that trainers and topics were confirmed at the time of publishing; however, PetroSync may necessitate substitutions, alterations or cancellations of the trainers or topics or location (classroom / Virtual). As such, PetroSync reserves the right to change or cancel any part of its published programme due to unforeseen circumstances. Any substitutions or alterations will be updated on our web page as soon as possible

DATA PROTECTION

The information you provide will be safeguarded by PetroSync that may be used to keep you informed of relevant products and services. As an international group we may transfer your data on a global basis for the purpose indicated above. If you do not want us to share your information with other reputable companies, please tick this box

CANCELLATION POLICY

Delegates who cancel after the training is officially confirmed run by email, are liable to pay the full course fee and no refunds will be granted. You may substitute delegates at any time as long as reasonable advance notice is given to PetroSync.

In the event that PetroSync cancels or postpones or change the trainer or change the training location (classroom / virtual) of an event for any reason and that the delegate is unable or unwilling to attend in on the rescheduled date, you will receive a credit voucher for 100% of the contract fee paid. You may use this credit voucher for another PetroSync to be mutually agreed with PetroSync, which must occur within a year from the date of postponement.

PetroSync is not responsible for any loss or damage as a result of the cancellation policy. PetroSync will assume no liability whatsoever in the event this event is cancelled, rescheduled or postponed due to any Act of God, fire, act of government or state, war, civil commotion, insurrection, embargo, industrial action, or any other reason beyond management control.

CERTIFICATE OF ATTENDANCE

80% attendance is required for PetroSync's Certificate of Attendance.

DETAILS

Please accept our apologies for mail or email that is incorrectly addressed.

Please email us at registration@petrosync.com and inform us of any incorrect details. We will amend them accordingly.

Find us on Social Media:

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CHARGES & FEE(s)

- For Payment by Direct Telegraphic Transfer, client has to bear both local and oversea bank charges.

- For credit card payment, there is additional 4% credit card processing fee.