

5 Days Online Training On: **Oil and Gas Flow Assurance and Production Chemistry**



ABDULLAH HUSSEIN



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+91 6205464268/
+91 70194 95792

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COURSE OVERVIEW

This five-day course offers a comprehensive overview of the fundamentals of oil and gas flow assurance and production chemistry. The course is designed to provide the participants with the essential knowledge and skills to combat the main production chemistry issues in oil and gas fields.

A wide range of topics will be discussed, including phase separation, solids deposition, asset integrity, oilfield microbiology, production chemicals, water treatment, process monitoring, and lab activities, all discussed in the light of recent advances and technologies. After completing this course, the participants will gain core skills in production chemistry risk assessment, effective mitigation methods, good monitoring practices, and data management.

COURSE OBJECTIVES

- Acquire a comprehensive understanding of the fundamental principles of flow assurance.
- Identify the main flow assurance and production chemistry issues.
- Understand fluids equilibrium during production and gain the key practical skills for fluids sampling, analysis, and their methodologies.
- Gain practical skills in modeling and simulation.
- Gain the key skills to conduct robust risk assessment, implement effective treatment, and process monitoring.
- Gain essential skills in lab and process integration and data management.





BENEFITS OF ATTENDING THE COURSE

- Gaining essential knowledge in oil and gas flow assurance and production chemistry
- Acquiring core skills in fluids sampling and analysis
- Mastering the risk assessment skills for all production chemistry issues.
- Enhancing the required knowledge and skills for effective treatment
- Acquiring core skills in production chemistry and system monitoring
- Enhancing the lab data and process management skills
- Effective learning from several case studies
- Stay updated with the recent advances in oil and gas production chemistry technologies.



WHO SHOULD ATTEND

Essentially, anyone who is interested in gaining practical and professional skills in oil and gas production chemistry. The course is highly recommended for the following:

Production Technicians

OIMs,
Supervisors, &
area managers

Production Engineers

Reservoir Engineers

Production Chemists

Microbiologists

Lab Chemists

Corrosion Engineers

Account Managers

Students &
interns



PREREQUISITES

No prerequisites are required. The course suits all operators and management levels.

COURSE AGENDA

DAY 1

Introduction to flow assurance and production chemistry

- Introduction to oil and gas production system
- Production fluids and their Phase equilibrium
- The concept of flow assurance and its use in oil and gas systems
- Fluids hydrodynamics
 - Multiphase flow problems
- Production chemistry
 - Origins of production chemistry problems

Mineral scales and their management

- The cost of scale formation in oil and gas fields
- Scale formation mechanism
- Scale types and factors affecting them
- Scale risk assessment
 - Fluids analysis, scale prediction, system data review
- Scale analysis
- Scale monitoring methods
- Scale mitigation methods
 - Operational methods
 - Chemical inhibitors
- Chemicals testing, selection and application
 - Nonchemical methods
 - Scale removal methods
- How to design and implement an efficient scale management strategy?
- Case studies



DAY 2

Gas hydrate

- Operational and safety impacts of GH
- Mechanism of GH formation, GH types, and factors affecting them
- GH risk assessment
 - Fluids testing, GH prediction, and process data
- GH monitoring methods
- GH prevention methods
 - Operational methods
 - Chemical methods
- Chemicals testing, selection and application
- GH removal methods
- How to implement an efficient GH management strategy?
- Case studies



Wax problems

- Crude oil composition.
- Wax gelation and deposition mechanisms and factors affecting it.
- Risk assessment of wax problems.
 - Fluids analysis, wax prediction, system data review
- Wax deposits analysis
- Wax monitoring methods
- Wax mitigation methods:
 - Operational methods
 - Chemical methods
- Chemicals testing, selection, and application
 - Nonchemical methods
 - Wax removal methods
 - How to design and implement an effective wax management strategy?
- case studies

Asphaltene problems

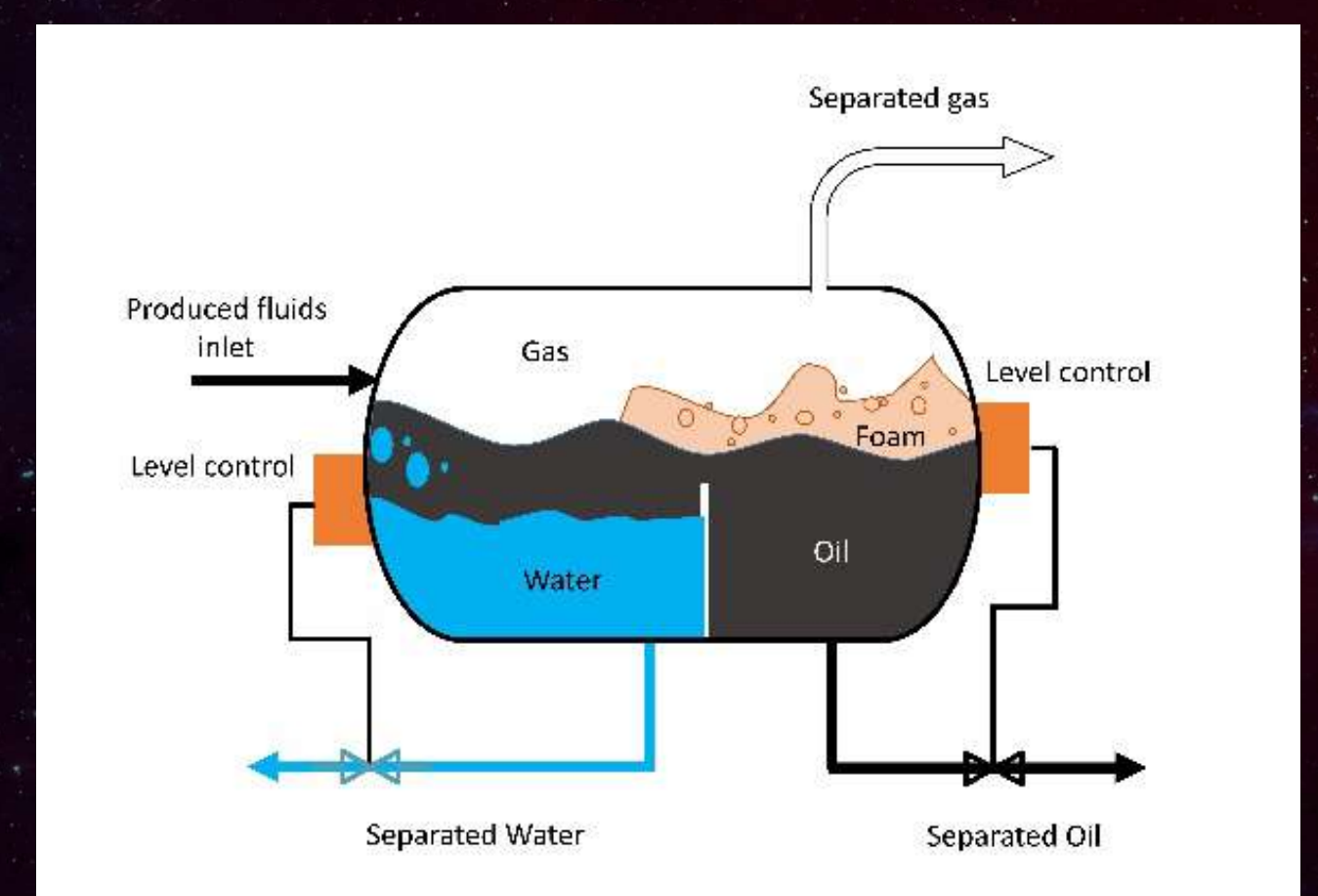
- Asphaltene composition and properties
- Asphaltene aggregation and deposition
- Asphaltene risk assessment
 - Fluids testing, asphaltene prediction and system data review
- Asphaltene deposits analysis
- Monitoring of asphaltene deposition
- Asphaltenes mitigation methods:
 - Operational methods
 - Chemical methods
- Chemicals testing, selection and application
 - Nonchemical methods
 - Asphaltene removal methods
- How to design and implement an effective asphaltene management plan?
- Case studies



DAY 3

Crude oil dehydration, emulsions, sludge and foam

- Emulsions formation mechanisms
- Factors affecting emulsions formation
- Emulsion types
- Crude oil dehydration methods
- Crude oil dehydration equipment
- Chemical methods
 - Testing, selection, and application of demulsifiers
- Field monitoring of emulsion
- Reverse emulsion mitigation methods
- Sludge problems in oilfield
- Sludge mitigation and removal methods
- Foam problems in oilfields
- Methods of mitigating foam
- Case studies



Gas dehydration

- Types of gas dehydration processes
 - Absorption, adsorption and condensation methods
- TEG dehydration equipment and operations
- Common problems during gas dehydration

Naphthenate and carboxylate soaps

- Composition of naphthenic and carboxylic acids
- Soap formation mechanisms and factors affecting it
- Soap emulsions vs soap scale
- Soap risk assessment
 - Fluids testing, prediction, and system data review.
- Soap mitigation methods
 - Operational methods
 - Chemical methods
- How to design and implement an effective soap mitigation strategy?
- Case studies



DAY 4

Corrosion and asset integrity

- Impacts and cost of corrosion in oil and gas industry
- Mechanisms of corrosion
- Forms of corrosion
- Factors impacting corrosion problems in oil and gas fields
- Corrosion risk assessment
- Corrosion monitoring
- Corrosion management methods
 - System design improvement
 - Material selection
 - Protective coating
 - Corrosion inhibitors
- Testing, selection and application of corrosion inhibitors
 - Cathodic protection
 - Other methods
- Case studies



Oilfield microbiology

- Microorganisms in oil and gas fields
- Impacts of microorganisms on production
- Types of microorganisms in oil and gas fields
- Factors affecting microorganisms growth in petroleum fields
- Microbiologically influenced corrosion (MIC)
- Biofouling
- Reservoir souring
- Other types of damage by microorganisms
- Microorganisms detection and monitoring methods
- Microorganisms management
 - Operational methods of controlling microorganisms
 - Chemical methods of controlling microorganisms
 - Non-chemical methods of controlling microorganisms
- Case studies
- Microbial enhanced oil recovery (MEOR)

H2S management

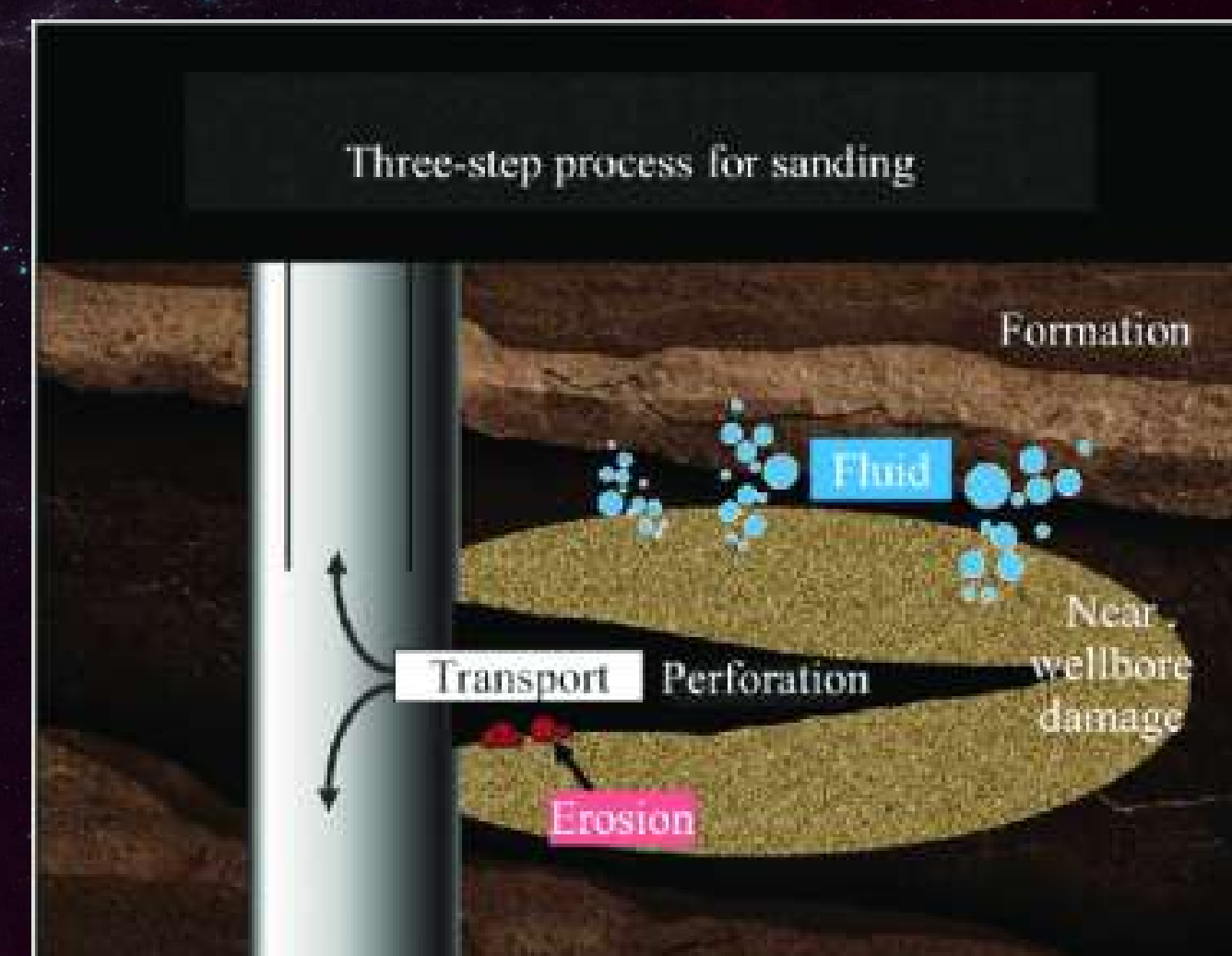
- Origins of H₂S in oil and gas fields
- Impacts of H₂S on production
- H₂S measurement in gas, oil and water phases
- H₂S mitigation methods
- Case studies



DAY 5

Sand production

- Causes of sand production
- Impacts of sand production on operations
- Management of sand production



Water treatment in oil and gas fields

- Water injection treatment processes
- Injection water quality and testing
- Produced water treatment processes
- Produced water re-injection



Production chemicals management

- Production chemical types
- Chemical tendering
- Chemical application methods
- Effective Chemical management

Carbon capture and storage

- CO₂ capture methods
- CO₂ transport and storage
- Issues related to CCUS

Oilfield monitoring methods

- Chemical analysis methods
- Process parameters monitoring
- Coupons, spools, and side streams
- Sensors
- Pigging and ILI
- Production logging methods
- Smart installation and robotics

Lab activities

- Crude oil analysis
- Water analysis
- Solids analysis
- Microbiological analysis
- Lube oil analysis
- Production chemicals analysis