

TRAINING TITLE

OIL-GAS-WATER THREE-PHASE SEPARATION FUNDAMENTALS

Training Duration

5 day

Training Venue and Dates

Ref. NO. PE210	Oil-Gas-Water Three-phase Separation Fundamentals	5	01-05 Sep. 2025	\$5,500	DUBAI, UAE
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In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- \$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

Efficient separation of oil, gas, and water is essential for optimizing production processes and ensuring the quality and integrity of the extracted fluids in upstream oil and gas operations. The 5-day course on Oil-Gas-Water Three-Phase Separation Fundamentals provides a comprehensive understanding of the principles, design, operation, and optimization of three-phase separators. This course is designed for professionals working in production, reservoir engineering, and field operations, offering knowledge and techniques to enhance separator performance and troubleshooting.

TRAINING OBJECTIVES

At the end of this course, the delegates should be able to:

- Understand the fundamental principles of oil-gas-water three-phase separation.
- Learn about the different designs of three-phase separators and their operational principles.
- Gain practical skills in optimizing separator performance and troubleshooting common issues.
- Understand how to manage emulsions, gas breakout, and phase carryover in separators.

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- Explore advanced separation technologies and best practices for sustainable and efficient operations.

WHO SHOULD ATTEND?

This course is ideal for professionals involved in the design, operation, and optimization of oil-gas-water separation systems, including:

- Reservoir Engineers
- Production Engineers
- Field Operators
- Petroleum Engineers
- Process Engineers
- Operations Technicians
- Maintenance Engineers
- HSE (Health, Safety, and Environmental) Professionals
- Plant and Facility Managers

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

COURSE PROGRAM:

Day 1: Introduction to Three-Phase Separation

- Overview of oil, gas, and water separation in upstream oil and gas operations.
- The importance of three-phase separation in maximizing production efficiency and meeting quality standards.
- Basic principles of phase separation: density differences, surface tension, and gravitational forces.

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- Types of separation processes: gravitational, mechanical, and chemical.
- Introduction to three-phase separators: design, components, and working principles.
- The function of each phase (oil, gas, and water) in the separator.
- Common challenges in three-phase separation: emulsion formation, carryover, and contamination.

Day 2: Separator Design and Operation

- Detailed exploration of three-phase separator designs: vertical vs. horizontal separators.
- Key design parameters: size, shape, and configuration.
- Design considerations for varying operating conditions: flow rates, pressure, temperature, and fluid properties.
- Operating principles: inlet distribution, gravity separation, coalescence, and gas disengagement.
- Maintenance and operational monitoring: level control, pressure control, and flow distribution.
- Introduction to internals of separators: demister pads, coalescers, and baffles.
- Identifying key parameters in separator design and operation.

Day 3: Phase Separation and Emulsion Management

- Understanding phase behavior: oil-water separation and gas-oil-water separation.
- Mechanisms of phase separation: settling velocities, particle size, and surface tension.
- The role of surfactants and emulsions in the separation process.
- Key factors that affect separation efficiency: fluid properties (viscosity, density, and surface tension).
- Emulsion breaking and treatment: chemical demulsifiers, heat, and mechanical methods.
- Troubleshooting emulsion problems in three-phase separators.
- Gas breakout and optimization techniques.
- examples of emulsion management in separators.

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Day 4: Separator Performance and Optimization

- Measuring and monitoring separator performance: flow rates, phase cut, and separation efficiency.
- Common performance issues: poor separation, water carryover, gas blow-by, and fouling.
- Troubleshooting separators: identifying causes and finding solutions.
- Techniques for optimizing separation efficiency: adjusting flow rates, pressure, and temperature.
- Technology advancements: automation and digital monitoring in separator operations.
- Optimization through operational data analysis: predictive maintenance and process control.
- Optimizing a three-phase separator operation based on case scenarios.

Day 5: Advanced Topics and Best Practices

- Advanced separation technologies: hydrocyclones, membranes, and centrifuges for enhanced separation.
- The role of advanced separation systems in reducing waste and improving recovery.
- Sustainability in three-phase separation: water reuse, waste reduction, and energy-efficient processes.
- Best practices for three-phase separation in various operating environments.
- Future trends in separation technologies: automation, AI, and IoT.
- Designing and optimizing a separator system for a specific field scenario.
- Course review, Q&A, and final assessment.
- Certification distribution and closing remarks.

NOTE:

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Pre-& Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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