MERCURY

Oil Production and Processing Facilities (PF-4)

13 – 24 September 2027
Madrid (Spain)



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Ref: 16323_1015782 **Date:** 13 – 24 September 2027 **Location:** Madrid (Spain) **Fees:** 11100 Euro

Introduction:

The Oil Production and Processing Facilities PF-4 training course provides a comprehensive foundation in surface production systems, oil treatment, and facility operations. The training course emphasizes the critical link between well inflow performance and the design, operation, and efficiency of processing facilities. Participants will gain in-depth insights into the compositions of oil, gas, and water, as well as their implications for selecting, sizing, and designing equipment and facilities.

Attention is given to the integration of thermodynamic and physical property correlations to ensure accurate engineering design. The Oil Production and Processing Facilities PF-4 program covers the essential concepts of separation, stabilization, and transportation, with practical applications in oil-water treatment and gas handling. It emphasizes resolving operational challenges in oil production systems. Participants will improve the skills to optimize facility performance and ensure reliability in complex production environments.

Targeted Groups:

This Oil Production and Processing Facilities PF-4 training targets professionals seeking specialized knowledge and skills:

- Petroleum engineers are involved in surface production operations.
- Process engineers are responsible for designing and optimizing facilities.
- Production and operations supervisors in oil fields.
- Maintenance and reliability engineers in upstream facilities.
- Reservoir engineers seeking facility operation insights.
- Field operators working with separation, treating, and storage systems.
- Health, safety, and environment professionals supporting oil facilities.
- Technical consultants and trainers in the oil and gas industry.

Targeted Competencies:

Participants will gain the following competencies during the Oil Production and Processing Facilities PF-4 program:

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- Ability to evaluate well inflow and facility integration.
- Skill in analyzing oil, gas, and water properties for facility design.
- Proficiency in selecting and sizing separation and treating equipment.
- Competence in identifying and solving processing issues.
- Expertise in oil stabilization, desalting, and storage operations.
- Capacity to design efficient water injection and treatment systems.
- Knowledge of crude transportation methods and challenges.
- Practical insight into gas handling and vapor recovery systems.
- Strength in applying thermodynamic correlations to engineering problems.

Course Objectives:

Participants will achieve the following objectives by completing the Oil Production and Processing Facilities PF-4 course:

- Assess inflow performance and determine its effect on facility operations.
- Analyze the compositions of crude oil, natural gas, and produced water to inform design decisions.
- Apply physical property data and thermodynamic principles to equipment design.
- Evaluate different oil gathering and processing systems for field applications.
- Select suitable separation equipment based on performance requirements.
- Perform sizing of separators, treaters, and desalters with accuracy.
- Investigate operational issues in oil-water processing and propose solutions.
- Design oil stabilization, sweetening, and vapor recovery strategies.
- Develop facility layouts that integrate crude oil storage and transport systems.
- Assess produced water treatment and reinjection requirements.
- Analyze solution gas handling and apply flare reduction measures.
- Implement flow assurance practices for reliable operations.
- Compare alternative facility configurations to meet project objectives.
- Solve troubleshooting cases in oil production facilities systematically.
- Integrate reservoir engineering fundamentals with surface operations to optimize production.

Studying Scenarios:

In this Oil Production and Processing Facilities PF-4 training, participants will develop their skills through the analysis of the following scenarios:

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- Evaluating the impact of declining well inflow on production facilities.
- Troubleshooting separator inefficiencies caused by fluctuating gas flow.
- Designing an oil gathering system for a multi-well development.
- Resolving emulsion problems in an oil-water treating facility.
- Optimizing oil stabilization to meet export vapor pressure standards.
- Managing produced water quality for disposal and reinjection systems.
- Assessing flow assurance challenges in crude oil pipelines.
- Selecting equipment for handling solution gas and reducing flaring.
- Designing a facility upgrade to increase oil treatment capacity.

Course Content:

Unit 1: Overview of Reservoir Engineering for Facilities Operations:

- Principles of reservoir drive mechanisms.
- Relationship between reservoir pressure and inflow performance.
- Reservoir deliverability and facility capacity matching.
- Estimation of production rates and decline curves.
- The Importance of Fluid Properties in Facility Design.
- Integration of Reservoir Data in Facility Planning.
- Overview of well testing and production data analysis.

Unit 2: Gas, Oil, and Water Composition and Properties:

- Fundamental properties of crude oil and natural gas.
- Water salinity, scaling, and corrosion issues.
- Role of phase behavior in equipment selection.
- Oil gravity, viscosity, and paraffin content.
- Gas compressibility and heating values.
- Implications of fluid characterization on processing.
- PVT analysis and laboratory test data.

Unit 3: Oil Gathering Systems:

- Field layout for gathering and trunk lines.
- Manifold systems for multi-well operations.
- Two-phase and three-phase gathering approaches.
- Pressure considerations in gathering design.
- Pigging requirements and corrosion protection.
- Leak detection and monitoring methods.
- Economic evaluation of gathering networks.

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Unit 4: Gas-Liquid Separation:

- Principles of gas-liquid separation.
- Types of separators: horizontal, vertical, spherical.
- Selection criteria for separator design.
- Sizing equations and performance checks.
- Effect of Gas/Oil Ratio on Separation Efficiency.
- Control systems for stable separator operation.
- Common operational problems and solutions.

Unit 5: Oil-Water Separation:

- Mechanisms of oil-water separation.
- Gravity separation and retention time design.
- Role of demulsifiers and chemical additives.
- Electrostatic treaters and coalescers.
- Produced water handling requirements.
- Troubleshooting emulsion and water quality issues.
- Integration of separation with downstream treating.

Unit 6: Oil Treating and Desalting:

- Importance of crude desalting before refining.
- Methods of salt removal and water wash systems.
- Electrical desalters and design considerations.
- Temperature and mixing effects on desalting.
- Controlling basic sediment and water BS&W.
- Environmental and corrosion concerns.
- Case studies of desalting performance.

Unit 7: Oil Stabilization, Sweetening, Storage, and VRU Crude:

- Objectives of oil stabilization and vapor pressure control.
- Processes for oil sweetening and sulfur removal.
- Storage tank design and safety requirements.
- Vapor Recovery Units VRUs for emissions control.
- Integration of stabilization with export requirements.
- Operational challenges in storage facilities.
- Best Practices for Safe Oil Handling and Storage.

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Unit 8: Flow Assurance for Surface Facilities:

- Challenges in maintaining steady fluid flow.
- Wax, hydrate, and asphaltene deposition risks.
- Pipeline insulation and heating systems.
- Use of inhibitors for hydrate and wax control.
- Pigging and cleaning schedules.
- Monitoring tools for flow assurance.
- Flow assurance in offshore and onshore facilities.

Unit 9: Transportation of Crude Oil:

- Pipeline transportation fundamentals.
- Pumping stations and pressure control.
- Crude oil blending and viscosity reduction.
- Tanker loading and offloading systems.
- Truck and rail transport considerations.
- Safety and environmental regulations.
- Economic aspects of oil transport.

Unit 10: Produced Water Treatment and Water Injection Systems:

- Characteristics of produced water and contaminants.
- Treatment technologies include gravity, flotation, and filtration.
- Oil removal requirements before disposal.
- Regulatory compliance for water quality.
- Design of water injection facilities.
- Injection well monitoring and integrity.
- Scaling and corrosion control in water systems.

Final Insights & Key Takeaways:

The Oil Production and Processing Facilities PF-4 course equips professionals with essential knowledge of oil field surface systems and facility operations. Participants gain practical expertise in equipment design, separation, treating, and crude transportation. It emphasizes solving real-world challenges in oil-water processing, flow assurance, and the treatment of produced water. Participants will optimize facility performance and ensure safe, reliable, and efficient operations in the oil and gas industry.