



Field Processing & Surface Production  
Facilities



# Field Processing & Surface Production Facilities

## Introduction:

This field processing and surface production facilities course focuses on a comprehensive understanding of onshore and offshore oil and gas field processing techniques and knowledge of surface production facility equipment's technology and operating principles.

The field processing and surface production facilities course aims to provide an overview and fundamental understanding of the wide range of oilfield production handling and treatment equipment and showcase new technologies in the field processing and surface production facilities domain.

## Targeted Groups:

- Chemical, Mechanical Engineers, and Process Technologists.
- Facility and Inspection engineers.
- Maintenance or Project Engineers.
- Operations and Laboratory Chemists.
- Technicians, Support Engineers, and Engineering Trainees.
- Consultants and Sales Professionals.

## Course Objectives:

At the end of this field processing and surface production facilities course, participants will be able to:

- Learn the origins and chemical characteristics of Oil and Gas.
- Understand the challenges associated with offshore operations, horizontal drilling, and other safety concerns.
- Familiarize the participants with various methods and techniques for exploring, drilling, producing, treating, and transporting Oil, Gas, and their products.
- Introduce the participants to upstream, midstream, and downstream operations.
- Appreciate Oil and Natural Gas treatment technologies and processes, including produced water treatment.
- Learn the many processes involved in crude oil refining and how these contribute to refinery complexity and profitability.
- Gain valuable knowledge of Gas Sweetening and Physical Solvents Unit Troubleshooting.

## Targeted Competencies:

Upon the end of this field processing and surface production facilities training, participants' competencies will:

- Exploration activities.
- Gathering and separation.
- Gas injection.
- Hydrates and Gas Dehydration.
- Know the specifications and process selection.
- Downstream Operations.
- Oil and Gas pricing.

## Surface Production Equipment and Technologies:

As we delve deeper into the specifics of field processing and surface production operations, we must recognize the significance of surface production equipment and technologies. These systems provide:

- Understand Essential functions in oil and gas surface production facilities.
- Aid in separating.
- Treat.
- Handle hydrocarbons once they reach the surface.

Understanding the different surface production systems, including their design and operational efficiencies, is crucial for optimizing production and ensuring safe, environmentally compliant operations in oil field processing.

## Course Content:

### Unit 1: Fundamentals of Reservoir & Drive Mechanism:

- Reservoir types.
- Exploration techniques.
- Drive mechanisms.
- Enhanced Oil Recovery EOR.

### Unit 2: Fundamentals of Drilling, Completion & Well Performance:

- Drilling principle.
- Offshore drilling.
- Main completion equipment.
- Principle of artificial lift.

### **Unit 3: Well Effluent Transportation, Flow-Assurance & Gas Hydrates Prevention:**

- Network design and operation.
- Lead flow assurance multiphase flow, and flow patterns.
- Hydrates formation prevention strategies, hydrates inhibition.
- Gas condensate field development deep-offshore production.

### **Unit 4: Crude Oil Processing:**

- Multi-Stage Separation MSS.
- Management of foam issues.
- Crude dehydration and desalting.
- Emulsion treatment.
- Crude sweetening H<sub>2</sub>S removal.

### **Unit 5: Production & Injection Water Treatment:**

- Quality requirements for the production of water.
- Environment-related constraints.
- API oil-water separators, plate separators, flotation, hydro cyclones.
- Reasons for water injection.
- Quality requirements and necessary treatments.

### **Unit 6: Offshore Developments:**

- Offshore production structures.
- Storage and offloading vessels.
- Flow assurance.
- Preservation techniques and pigging solutions.

### **Unit 7: Fundamentals of Corrosion:**

- Types of corrosion.
- Prevention and Monitoring.

### **Unit 8: Electrical Systems - Instrumentation & Process Control - Safety Systems:**

- Electrical power generation.
- Electrical power distribution network and equipment.
- Field instrumentation controllers control loop structures.
- Distributed Control System DCS.
- Safety Instrumented Systems SIS: ESD, HIPS, fire and gas system.

### **Unit 9: Metering & Allocation:**

- Meter and production allocation.
- Production accounting and material balance.
- Transactional metering of liquids and gas.
- Multiphase metering: advantage, principle, and fields of application.