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# Oil Production Operations: Separation, Water Handling and Safety Training Course

9 – 13 May 2027  
Amman





## Oil Production Operations: Separation, Water Handling and Safety Training Course

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### Programme Summary

Oil production operations are the focus of this five-day training course for operations and facilities leaders at managerial level, ending in a facility operating review and improvement plan. Wells deliver a mixture of oil, gas, water and solids that surface plant must separate, treat and export to specification without incident. The programme moves from process principles through separation and treatment, water and gas handling, and safety systems, to application on a chosen facility. Mars Training Centre UK delivers this programme in oil production operations.

### The Business Case

Surface facilities decide how much of a field's potential reaches the export line. Unstable separation, carry-over and off-specification crude cost production and add risk. Leaders who read process data well can protect throughput and decide shutdowns on evidence.

- Production Uptime: Rises as recurring trips, fouling and control problems are diagnosed and removed.
- Export Specification Compliance: Improves as treatment and water handling performance is monitored against limits.
- Process Safety Exposure: Falls as safeguards, relief paths and alarm response are tested and maintained.

### Principles and Evidence Base

- API Spec 12J: Its requirements for oil and gas separators frame the separation analysis in Session 1 and the troubleshooting in Session 2.
- API RP 14C: Its basic surface safety system analysis guides the safeguard review in Session 4.
- API Standard 521: Its pressure-relieving and depressuring principles shape the relief and flare discussion in Session 4.
- IEC 61511: Its functional safety lifecycle for the process industry structures the instrumented protection review in Session 4.

### Intended Participants

- Leaders accountable for the daily performance of oil production and processing plant.
- Managers who coordinate operations, maintenance and engineering on a surface facility.
- Supervisors moving into facility management who need the whole process in view.
- Asset and reliability leaders who must justify plant improvement and shutdown scope.



The programme serves upstream operators, national and international oil companies, field service providers and joint venture teams.

## Learning Outcomes

1. Participants will be able to trace oil, gas and water through a production facility and locate the control points that govern each stream.
2. Participants will be able to diagnose separator and treater performance problems from process data.
3. Participants will be able to evaluate produced water and gas handling options against operating and discharge limits.
4. Participants will be able to assess the adequacy of safeguards, alarms and relief arrangements on a production plant.
5. Participants will be able to prioritise operating improvements by effect on throughput, quality and risk.
6. Participants will be able to justify a facility improvement plan to asset and operations management.

## Programme Structure

### Day 1: Oil Production Operations and Separation Principles

How do wellstream fluids behave, and how is each phase separated?

- Wellhead to Export Block Flow Diagram
- Phase Behaviour and Flash Calculation Basics
- Two-Phase and Three-Phase Separator Sizing Logic
- Level, Pressure and Interface Control Loops
- Slugging, Foaming and Carry-Over Symptoms

### Day 2: Crude Treatment and Stabilisation

What brings crude within specification, and what disturbs it?

- Heater Treater and Emulsion Breaking Principles
- Chemical Demulsifier Selection and Dosing
- Desalting and Dehydration Stage Performance
- Stabilisation and Vapour Pressure Control
- Fiscal and Custody Metering Checks

### Day 3: Produced Water and Gas Handling

How are water and gas treated, reused or disposed of within limits?



- Produced Water Treatment Train Review
- Hydrocyclone and Flotation Unit Diagnostics
- Water Injection and Disposal Considerations
- Gas Compression and Dehydration Overview
- Flare, Vent and Fuel Gas Balance

## Day 4: Process Safety and Control Systems

Are the safeguards on this plant adequate and kept healthy?

- Safety Analysis Table Review From API RP 14C
- Relief, Depressuring and Flare Load Principles
- Safety Instrumented Function Lifecycle From IEC 61511
- Alarm Management and Operator Response
- Start-Up, Shutdown and Isolation Procedures

## Day 5: Applying Oil Production Operations to a Facility

Which improvements deliver the most value, and is the plan ready for approval?

- Applying Day 1 Separation Diagnosis to Case Data
- Testing Day 3 Water and Gas Constraints Against Throughput
- Ranking Day 4 Safeguard Gaps by Risk
- Debottlenecking and Shutdown Scope Options
- Completing the Facility Operating Review and Improvement Plan

## Methodology

The programme is built around case analysis and data review. Participants work with anonymised process trends, simplified flow diagrams and incident summaries from onshore and offshore facilities, diagnose what the data shows and defend their conclusions in group discussion. Sessions end by linking findings to the facility plan each participant builds during the week.

- Suggested activity: Diagnosing a separator upset from level, pressure and flow trends.
- Suggested activity: Ranking safeguard gaps on a simplified production platform diagram.
- Suggested activity: Presenting a debottlenecking case to a simulated asset review board.

## Capstone Output

Each participant completes a facility operating review and improvement plan for one production plant, real or case-based. It holds a process flow summary, performance findings, water and gas constraints, a safeguard gap register and ranked actions with owners. It is used to brief asset management and to scope the next shutdown or optimisation work.



## Frequently Asked Questions

### **Is this oil production operations course suitable for managers without a process engineering degree?**

Yes. It is set at managerial level for leaders who oversee production facilities, and assumes operating or supervisory experience rather than design calculations.

### **Which standards does oil production operations training rest on?**

It rests on API Spec 12J for separators, API RP 14C for surface safety systems, API Standard 521 for pressure relief and IEC 61511 for functional safety. Each is applied to case data.

### **How is the oil production operations capstone plan used at work?**

The facility operating review and improvement plan briefs asset management, ranks performance and safety actions by value and risk, and scopes the next shutdown or optimisation work.