



# **CO2 Surface Facilities Operations and Integrity Course**

18 – 22 April 2027  
Johannesburg

## CO2 Surface Facilities Operations and Integrity Course

**Ref:** 961\_173306 **Date:** 18 – 22 April 2027 **Location:** Johannesburg **Fees:** 6000 Euro

### Overview

CO2 Surface Facilities Operations and Integrity Course is a 1-week advanced course for process, facilities, project, and operations professionals who leave with a CO2 Surface Facility Operating and Integrity Plan. Participants connect conditioning, compression, dehydration, metering, dense-phase transport, injection support, materials, corrosion control, process safety, troubleshooting, and performance assurance across facility interfaces. Agile Leaders Training Center delivers this course on CO2 surface facilities operations and integrity.

### Who Should Attend

- Teams responsible for CO2 gathering, conditioning, compression, and dehydration operations.
- Functions responsible for facility design reviews, project interfaces, and commissioning readiness.
- Teams responsible for pipeline transport, metering, and injection-facility coordination.
- Functions responsible for materials selection, corrosion control, and mechanical integrity.
- Leaders responsible for process safety, reliability, troubleshooting, and performance assurance.

The course assumes participants already work with process facilities or pipeline systems and leaves out introductory thermodynamics, detailed reservoir engineering, and subsurface storage design.

### Departments and Industries

The course supports CO2 surface-facility decisions across energy, industrial processing, transport infrastructure, and carbon-management projects.



- Process and facilities engineering
- Operations and production support
- Pipeline and terminal operations
- Mechanical integrity and corrosion management
- Project delivery and commissioning

## **Learning Objectives**

By the end of this course, participants will be able to:

- Analyze CO<sub>2</sub> phase behavior and impurity effects across surface facilities.
- Evaluate conditioning, compression, dehydration, and metering configurations.
- Apply materials, corrosion, integrity, and process-safety controls.
- Diagnose operating disturbances across transport and injection interfaces.
- Build performance indicators and operating envelopes for CO<sub>2</sub> systems.
- Develop a CO<sub>2</sub> Surface Facility Operating and Integrity Plan.



## **Course Agenda**

### **Day 1: CO2 Facility Basis and Interfaces**

- CO2 Phase Envelope Interpretation Method
- Surface Facility Block Flow Diagram
- CO2 Stream Quality Specification Matrix
- Source-to-Injection Interface Register
- Operating Design Basis Checklist

### **Day 2: Conditioning and Compression Systems**

- Impurity Impact Assessment Matrix
- Compression Train Configuration Map
- Interstage Cooling and Separation Review
- Dehydration Duty Selection Framework
- Energy and Capacity Performance Model

### **Day 3: Metering, Transport, and Injection Support**

- CO2 Metering Uncertainty Budget
- Dense-Phase Transport Operating Envelope
- Booster Pump and Pressure Control Logic
- Pipeline Inventory and Line-Pack Method
- Injection Header Interface Control Document

### **Day 4: Integrity, Safety, and Troubleshooting**

- Materials Compatibility Screening Matrix
- Water and Corrosion Threat Register
- CO2 Release Hazard Bow-Tie Analysis
- Safeguard and Shutdown Cause-and-Effect Review
- Disturbance Diagnosis Decision Tree

### **Day 5: Operating and Integrity Plan Practice**

- Suggested Exercise: Stream Quality Excursion Diagnosis
- Suggested Exercise: Compression Constraint Resolution
- Suggested Exercise: Transport Interface Risk Review
- Suggested Exercise: Integrity Indicator Prioritization
- Capstone Exercise: CO2 Surface Facility Operating and Integrity Plan

## Practical Exercises

The course uses suggested activities to connect process behavior, equipment performance, integrity threats, and operating decisions.

- Suggested activity: diagnose a changing CO<sub>2</sub> stream using phase behavior, impurity, dehydration, and compression evidence.
- Suggested activity: define a transport operating envelope and response actions for pressure, temperature, and composition deviations.
- Suggested activity: build a bow-tie linking release scenarios, safeguards, monitoring, and escalation decisions.
- Suggested activity: integrate operating limits, integrity controls, indicators, and interface responsibilities into the capstone plan.

## FAQs

### Who suits CO<sub>2</sub> surface facilities operations and integrity training, and what does it assume?

Process, facilities, project, pipeline, integrity, and operations professionals suit the training. It assumes practical experience with process facilities or transport systems and excludes introductory thermodynamics and subsurface reservoir design.

### How does CO<sub>2</sub> surface facilities training differ from carbon capture process training?

CO<sub>2</sub> surface facilities training begins after capture and focuses on conditioning, compression, dehydration, metering, transport, injection interfaces, integrity, and operability; carbon capture training focuses mainly on separating CO<sub>2</sub> from source streams.

### Why is CO<sub>2</sub> stream quality important for surface facilities?

CO<sub>2</sub> stream quality affects phase behavior, compression demand, dehydration duty, metering, materials, corrosion risk, pipeline operation, and injection-facility acceptance.

### How are CO<sub>2</sub> surface facility operating limits established?

CO<sub>2</sub> operating limits combine stream specifications, phase envelopes, equipment constraints, pressure and temperature boundaries, integrity threats, safeguard capacity, transport requirements, and injection-interface conditions.



## Conclusion

Participants take back a CO2 Surface Facility Operating and Integrity Plan that connects stream quality, equipment limits, transport interfaces, integrity threats, safeguards, and response actions. The plan makes operational decisions and ownership visible. It supports coordinated performance assurance across engineering, operations, projects, pipeline, integrity, and injection-support teams.