

Water Injection System Design and Treatment Training Course

21 – 25 March 2027
Muscat

AGILE LEADERS
Training Center

AGILE LEADERS
Training Center

Water Injection System Design and Treatment Training Course

Ref: 2050_250566 **Date:** 21 – 25 March 2027 **Location:** Muscat **Fees:** 6500 Euro

Overview

Water Injection System Design and Treatment Training Course is a one-week intermediate course for water injection, process, facilities, mechanical, production, integrity, operations, and maintenance functions who leave with a Water Injection Facilities Design File. Participants connect injection water treatment, water injection facilities, injection pumps, hydraulics, controls, commissioning, monitoring, and system integrity. The course turns source-water and operating evidence into traceable surface-facility decisions. Agile Leaders Training Center presents water injection system design and treatment.

Who Should Attend

- Functions responsible for water-injection design bases and process selection
- Teams responsible for treatment equipment and injection-water quality
- Functions responsible for pump, pipeline, hydraulic, and mechanical design
- Groups responsible for injection operations, controls, and commissioning
- Teams responsible for corrosion, scaling, biofouling, and system integrity
- Maintenance functions responsible for equipment reliability and troubleshooting

The course assumes participants work with process data, equipment, piping, water chemistry, or injection operations; it leaves out reservoir pattern design, sweep forecasting, and detailed civil design.

Departments and Industries

The course supports departments and industries that design, operate, or assure surface water-injection facilities.

- Onshore and offshore oil production
- Seawater and produced-water treatment facilities
- Process and facilities engineering departments
- Mechanical, piping, and rotating-equipment functions
- Operations, maintenance, and commissioning teams
- Water services and subsurface-fluid injection projects

Learning Objectives

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

- Analyze source-water properties and injection-quality requirements
- Build filtration, deoxygenation, sulfate-control, and dosing trains
- Apply hydraulic and pump-selection methods to injection facilities
- Evaluate materials, corrosion, scaling, and biofouling controls
- Diagnose treatment, pump, pipeline, and instrumentation deviations
- Prioritize commissioning, monitoring, and integrity actions

Course Agenda

Day 1: Establish the Injection Design Basis

- Source-Water Characterization and Variability Profile
- Injection-Water Quality Specification Matrix
- Contaminant, Compatibility, and Formation-Risk Register
- NORSOK P-002 Process-System Boundary Map
- Water Injection Design-Basis Memorandum

Day 2: Configure the Treatment Train

- Screening, Clarification, and Filtration Selection Chart
- Deoxygenation and Oxygen-Scavenger Control Sheet
- Sulfate Removal and Nanofiltration Decision Matrix
- Biocide, Scale-Inhibitor, and Chemical-Dosing Plan
- Treatment-Train Mass Balance and Performance Table

Day 3: Design Pumps and Distribution

- System Hydraulic Profile and Pressure-Loss Model
- API 610 Injection-Pump Data Sheet
- Pump Operating-Envelope and Minimum-Flow Map
- Storage, Booster, and High-Pressure Injection Arrangement
- Pipeline, Valve, and Injection-Manifold Design Checklist

Day 4: Control Integrity and Commissioning

- Materials, Corrosion, and Erosion Selection Register
- Scaling, Biofouling, and Microbiological Control Plan
- Instrumentation, Alarm, and Shutdown Cause-and-Effect Matrix
- Precommissioning, Flushing, and Performance-Test Procedure
- Treatment and Injection Performance Dashboard

Day 5: Practice Facility Decisions

- Suggested Exercise: Reconcile an Injection-Water Specification
- Suggested Exercise: Configure a Source-Specific Treatment Train
- Suggested Exercise: Size and Check an Injection-Pump Duty
- Suggested Exercise: Diagnose a Treatment and Pipeline Deviation
- Capstone Exercise: Present a Water Injection Facilities Design File

Practical Exercises

The course uses suggested activities to convert water-quality, equipment, hydraulic, and operating evidence into facilities decisions.

- Suggested activity: compare seawater and produced-water sources against solids, oxygen, sulfate, compatibility, and biological risks.
- Suggested activity: assemble filtration, deoxygenation, membrane, and chemical-dosing duties into a treatment train.
- Suggested activity: build a hydraulic profile and check pump duty, operating limits, piping losses, and manifold pressure.
- Suggested activity: diagnose linked treatment, corrosion, pump, pipeline, instrument, and commissioning deviations.

FAQs

Who suits water injection system design training, and what does it assume?

Water injection system design training suits process, facilities, mechanical, production, integrity, operations, and maintenance functions. It assumes participants already work with process data, equipment, water chemistry, piping, or injection operations.

How does water injection system design differ from reservoir waterflood management?

Water injection system design concentrates on source-water treatment, equipment, pumps, hydraulics, pipelines, controls, commissioning, and surface integrity. Reservoir waterflood management concentrates on patterns, sweep, pressure support, connectivity, and recovery performance.

How is an injection water treatment train selected?

An injection water treatment train is selected by comparing source variability, target water quality, solids, oxygen, sulfate, oil, compatibility, biological risks, operability, monitoring needs, and downstream equipment limits.

What drives injection pump selection in water injection facilities?

Injection pump selection is driven by required flow, suction conditions, total dynamic head, operating range, fluid properties, materials, control philosophy, minimum flow, reliability, and the pressure limits of connected equipment.

What evidence supports water injection system troubleshooting?

Water injection troubleshooting uses water analyses, filter differential pressure, dissolved oxygen, chemical dose, membrane performance, pump curves, vibration, pressure and flow trends, corrosion data, inspection findings, alarms, and recent operating changes.

Conclusion

Participants take a Water Injection Facilities Design File back to their organization. It links source characterization, treatment duties, hydraulic calculations, pump data, materials, controls, commissioning checks, performance indicators, and integrity actions. The file changes separate design and operating records into a traceable basis for facility selection, startup, monitoring, troubleshooting, and maintenance decisions.