

Comprehensive Training in Water Treatment Plant Design, Commissioning, and Operation

16 – 20 November 2026
Abu Dhabi

AGILE LEADERS
Training Center

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Comprehensive Training in Water Treatment Plant Design, Commissioning, and Operation

Ref: 103600342_262427 **Date:** 16 – 20 November 2026 **Location:** Abu Dhabi **Fees:** 6500 Euro

Course Overview:

The course is a corporate-level program based on the industry-standard reference "Water Treatment Plant Design" AWWA & ASCE. This course blends engineering principles, operational insight, and regulatory compliance into one cohesive curriculum. It walks professionals through water treatment plant design, water treatment plant commissioning, and the water plant start-up checklist. The course emphasizes practical applications including pumping station design and operation, water distribution system design, and treatment process optimization. Key focus areas include clarification and filtration processes, coagulation and flocculation training, sedimentation basin design, and disinfection systems such as chlorination, UV, and ozone water treatment systems. Participants will also explore activated carbon filtration training, water pump station commissioning procedures, pipeline hydraulic design, and surge protection in pipelines. Advanced modules include SCADA systems for water treatment, process instrumentation and control, operator training for water plants, and chemical handling in water treatment. Membrane filtration system design including reverse osmosis, nanofiltration, and ultrafiltration systems, reservoir design, and water system reliability features are also addressed. From site selection to long-term capacity planning, this course prepares organizations for resilient and efficient facility operations.

Target Audience:

- Water Treatment Engineers
- Plant Operators and Supervisors
- Utility Managers
- Environmental and Civil Engineers
- Mechanical/Electrical Design Engineers
- SCADA and Instrumentation Specialists
- O&M Engineers

Targeted Organizational Departments:

- Engineering and Design
- Operations & Maintenance
- Health, Safety & Environment HSE
- Regulatory Compliance
- Project Management
- Capital Planning and Development

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Targeted Industries:

- Municipal Water Utilities
- Water Treatment Contractors
- EPC Firms Engineering, Procurement, Construction
- Industrial Water Users Oil & Gas, Chemicals, Manufacturing
- Environmental Consulting Firms
- Government Water Authorities

Course Offerings:

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

- Apply best practices in water treatment plant design and layout.
- Implement a full water treatment plant commissioning strategy.
- Execute a water plant start-up checklist in real-life scenarios.
- Design and troubleshoot pumping stations, reservoirs, and pipelines.
- Integrate chlorination, UV, and ozone disinfection systems.
- Design and optimize coagulation, flocculation, clarification, and filtration processes.
- Operate and maintain membrane filtration systems RO, UF, NF.
- Apply SCADA systems for water treatment plant monitoring.
- Ensure compliance with AWWA water treatment standards and regulatory goals.
- Identify long-term capacity planning and reliability design strategies.

Training Methodology:

The training blends theory and practice using interactive methods for corporate impact. Case studies from water facilities are included, with participants engaging in group sessions to simulate plant commissioning and SCADA implementation. Instructors will reference the Water Treatment Plant Design AWWA book to tackle real-life challenges in sedimentation, filtration, and disinfection. Role-playing and simulations enhance operator training while visual walkthroughs clarify pumping station design and instrumentation. Peer feedback and expert facilitation ensure participants gain practical knowledge.

Course Toolbox:

- Course ebook digital format
- Process design flowcharts and start-up checklists
- Case study library from global water utilities
- Access to reading materials based on "Water Treatment Plant Design" AWWA
- Templates for commissioning plans and safety protocols

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Course Agenda:

Day 1: Foundations of Water Treatment Plant Design

- **Topic 1:** Introduction to Water Treatment Plant Design Principles and Challenges
- **Topic 2:** Master Planning and Treatment Process Selection
- **Topic 3:** Water Quality Goals, Regulations, and Compliance Frameworks
- **Topic 4:** Preliminary and Final Design Phases in Water Projects
- **Topic 5:** Site Selection and Environmental Permitting
- **Topic 6:** Process Train Options and Treatment System Configurations
- **Reflection & Review:** Strategic planning, regulatory trends, and site decision factors

Day 2: Unit Processes - Intake, Mixing, Coagulation, and Clarification

- **Topic 1:** Intake Systems: Features, Design Types, and Screens
- **Topic 2:** Aeration and Air Stripping Design and Pilot Testing
- **Topic 3:** Mixing, Coagulation, and Flocculation Process Design
- **Topic 4:** Clarification Systems: Conventional, Sludge Blanket, and DAF
- **Topic 5:** Solids Contact Units and High-Rate Clarifiers
- **Topic 6:** Process Monitoring and Control in Pretreatment Units
- **Reflection & Review:** Performance trade-offs in intake, mixing, and clarification systems

Day 3: Filtration, Disinfection, and Chemical Handling

- **Topic 1:** High-Rate Granular Media and Rapid Sand Filtration
- **Topic 2:** Slow Sand and Diatomaceous Earth Filtration Systems
- **Topic 3:** Membrane Technologies: UF, NF, and RO Process Design
- **Topic 4:** Oxidation and Disinfection: Chlorine, Ozone, UV Systems
- **Topic 5:** Disinfection By-Products Control and Residuals Management
- **Topic 6:** Chemical Feed Systems, Storage, and Safety Handling Procedures
- **Reflection & Review:** Process integration for advanced filtration and disinfection

Day 4: Mechanical, Electrical, Instrumentation, and Hydraulic Systems

- **Topic 1:** Pumping Station Design, Reservoirs, and Large-Volume Flow Management
- **Topic 2:** Hydraulic Design: Head Loss, Surge Protection, and Pipeline Layout
- **Topic 3:** SCADA and Control Systems in Water Treatment Applications
- **Topic 4:** Process Instrumentation and Operational Monitoring Tools
- **Topic 5:** Electrical Systems: Power Distribution, Motors, and Protection
- **Topic 6:** Structural and Architectural Considerations in Treatment Plant Layout
- **Reflection & Review:** Designing integrated and resilient support systems

Day 5: Commissioning, Start-Up, O&M, and Design Optimization

- **Topic 1:** Water Treatment Plant Commissioning Plans and Phases
- **Topic 2:** Start-Up Checklists, Troubleshooting, and Process Testing
- **Topic 3:** Operator Training Programs and Knowledge Transfer
- **Topic 4:** O&M Considerations and Lifecycle Asset Management
- **Topic 5:** Pilot Plant Design, Testing, and Lessons for Scale-Up
- **Topic 6:** Long-Term Design Reliability, Safety, and Security in Water Systems
- **Reflection & Review:** Integration of design, commissioning, and operational continuity

FAQ:

What specific qualifications or prerequisites are needed for participants before enrolling in the course?

Specific qualifications or prerequisites are not mandatory; however, a basic understanding of water treatment, civil or environmental engineering, or plant operations will help participants get the most value from the training.

How long is each day's session, and is there a total number of hours required for the entire course?

Each day's session is structured to last around 6 hours, including breaks and interactive activities. The total course spans one week, resulting in approximately 30 hours of instruction.

What's the difference between slow sand filtration and rapid sand filtration in treatment system design?

Slow sand filtration is a biological process with slower flow rates, best suited for high-quality, low-turbidity water sources. Rapid sand filtration operates at higher flow rates with coagulants, handling variable raw water and larger capacities. Design parameters for both are covered in detail during the course.

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How This Course is Different from Other Comprehensive Training in Water Treatment Plant Design, Commissioning, and Operation Courses:

This course is structured around the "Plant Start-Up Commissioning" combining theory, design practices, and real-world commissioning strategies. It aims at water industry professionals looking for practical tools in commissioning, disinfection system design, membrane filtration, and pipeline hydraulics. The curriculum includes topics like water plant safety, site selection, and SCADA systems. It focuses on applying knowledge in activated carbon filtration, ozone treatment, and reservoir design, providing practical toolkits, case studies, and multidisciplinary insights for effective corporate development.