Advanced Water Desalination Laboratory Operations & Quality Control

MEERIM VISIONARY TRAINING (FZE)
INSPIRING AMBITION AND SUCCESS

Training Program

25-29 JAN 2026

DUBAI, UAE

Why Invest in This Training?

Strengthening laboratory capability is one of the highest-impact investments for a desalination facility. A strong lab ensures:

- Reliable and safe water output
- Early detection of issues that could affect plant reliability
- Consistent compliance with national and international standards
- Optimization of RO and pre-treatment processes
- Accurate reporting for regulators, audits, and stakeholders
- Improved operational decision-making based on trustworthy lab data

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TECHNICAL PROPOSAL

ADVANCED WATER DESALINATION LABORATORY OPERATIONS & QUALITY CONTROL

Training Audience:

- Laboratory Technicians and Laboratory Analysts working in desalination plants
- Water Quality Engineers
- RO Plant Operators and Pre-treatment Operators
- Process Engineers and Chemical Engineers
- Environmental & Compliance Officers
- Quality Assurance / Quality Control (QA/QC) Personnel

Training Overview:

This 5-day program provides a full, practical understanding of desalination laboratory operations. From water chemistry to microbiological analysis, participants gain the skills necessary to maintain and optimize the water quality process while supporting operational reliability and regulatory compliance.

Training Objectives:

- Understand desalination processes and associated water chemistry requirements.
- Apply proper laboratory sampling, testing, and quality assurance methods.
- Perform chemical and microbiological tests aligned with global standards.
- Diagnose and interpret abnormal lab results and link them to plant performance.
- Monitor membrane health and prevent fouling or scaling using lab data.
- Implement safe handling of chemicals, reagents, and microbiological samples.
- Prepare accurate reports, maintain documentation, and meet compliance requirements.

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KEY OUTCOMES

BETTER PERFORMANCE, AND INCREASED CONFIDENCE IN WATER QUALITY DELIVERY.

Organizational Benefits:

- Improved water quality control and monitoring
- Reduced membrane fouling, scaling, and unplanned downtime
- Enhanced regulatory compliance and audit readiness
- Stronger integration between laboratory and operations teams
- Standardized and consistent laboratory procedures
- Improved plant reliability and operational efficiency

Personal Benefits:

- High-level mastery of desalination laboratory procedures
- Strong understanding of water chemistry and microbiology
- Better interpretation of test results for operational decisions
- Greater confidence in using lab instruments and conducting tests
- Improved safety, accuracy, and documentation practices
- Professional development aligned with international standards (ISO/WHO/APHA)

Training Methodology:

- *Instructor-led classroom sessions*
- *Instructor-led technical sessions*
- *Demonstrations of analytical procedures*
- *Hands-on laboratory exercises (where applicable)*
- *Case studies from leading desalination plants*
- *Real-world troubleshooting scenarios*
- *Group activities and daily knowledge checks*
- *Tools, templates, and lab documentation practices*
- *Group Debriefs & Q&A*

This course is ideal for anyone who needs a solid understanding of desalination water quality, analytical testing, laboratory procedures, and how lab data influences plant performance and compliance.

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Training Modules:

Day 1 – Foundations of Desalination & Water Chemistry

Module 1: Overview of Desalination Technologies

- RO, MSF, MED systems
- Impact on lab testing requirements

Module 2: Water Chemistry Essentials for Desalination

- pH, alkalinity, hardness, turbidity, TDS
- Scale formation, corrosion, and chemical reactions

Module 3: Sampling Techniques & Standards

- Correct sampling procedures
- Chain-of-custody
- Avoiding cross-contamination

Module 4: Introduction to Laboratory Requirements

- ISO 17025 fundamentals
- Laboratory QC and documentation

Day 2 – Chemical Analysis & Instrument Operation

Module 1: Key Laboratory Instruments

- pH meter
- Conductivity and TDS meter
- Turbidity meter
- Spectrophotometer
- Calibration procedures

Module 2: Chemical Testing Procedures

- Chlorine residual
- Nitrate, sulfate, silica
- Hardness and alkalinity
- Metals (Fe, Mn, Cu)

Module 3: Quality Assurance in Chemical Testing

- Error prevention
- Control charts
- Calibration records

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Training Modules:

Day 3 – Microbiology & Membrane Health Monitoring

Module 1: Microbiological Analysis

- HPC
- Total coliform and E. coli
- Biofouling indicators

Module 2: Membrane Fouling & Performance Indicators

- Identifying fouling types
- Biofilm detection
- Linking lab results to RO performance trends

Module 3: Laboratory Safety & Chemical Handling

- MSDS interpretation
- PPE requirements
- Waste management

Day 4 – Process Monitoring, Interpretation & Troubleshooting

Module 1: Linking Lab Data to Operations

- Feed water trends
- Permeate quality analysis
- Pre-treatment efficiency

Module 2: Common Water Quality Issues

- High turbidity
- Conductivity spikes
- Membrane scaling indicators
- Chlorine fluctuations

Module 3: Troubleshooting Workshops

- RCA (Root Cause Analysis)
- Case-based group exercises

Module 4: Optimization Strategies

- Chemical dosing adjustments
- Cleaning-in-place (CIP) triggers
- Pre-treatment modifications

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Training Modules:

Day 5 – Reporting, Compliance & Laboratory Management

Module 1: Reporting and Documentation

- Lab report structure
- Data logging and trending
- Communication with operations

Module 2: Regulatory Compliance

- WHO drinking water standards
- Oman EPA water quality requirements
- Internal QC standards

Module 3: Laboratory Management Systems

- SOP development
- Logbook and calibration plan
- Internal audits

Module 4: Final Assessment & Presentation

- Practical evaluation
- Interpretation exercises
- Group case presentation

Closing Notes & Certificates

TALK TO US

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MEERIM Visionary Training FZE:
Mobius Institute: An Authorized Training & Examination Center

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ISO 9001:2015 ISO 14001:2015 ISO 45001:2018