



OPERATION AND MAINTENANCE OF SEAWATER REVERSE OSMOSIS DESALINATION PLANTS

This training program provides practical understanding of key desalination plant treatment processes and focuses on plant process and equipment operation, maintenance, monitoring, troubleshooting and optimization.

3-DAY COURSE

Leading Lecturer:

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PROGRAM OUTLINE

Day 1: Desalination Plant Operation and Performance Monitoring

09:00 – 10:30 Reverse Osmosis Fundamentals

- Desalination Plant Treatment Process Overview
- RO Separation – Basic Principles
- Key Performance Parameters
- Criteria for Well Operating Plant

10:30 – 10:45 Coffee Break

10:45 – 12:00 Source Water Quality Characterization

- Source Water Quality Factors
- Salt Content/Ionic Strength
- Suspended Solids and Organic Fouling

- Biofouling
- Membrane Scaling Potential
- Chemical Compounds with Destructive Impact on RO Membranes

12:00 – 13:00 Lunch Break

13:00 – 14:30 Intake System – Operation and Performance Monitoring

- Key Operations Tasks
- Source Seawater Data Collection
- Performance Monitoring, Maintenance and Troubleshooting

14:30 – 14:45 Coffee Break

14:45 – 16:30 Seawater Pretreatment System – Operation and Performance Monitoring

- Pre-chlorination System
- Source Water Chemical Conditioning System
- Dissolved Air Flotation Clarifiers
- Pretreatment Filters
- Cartridge Filters

16:30 – 17:00 Questions and Discussions

Day 2: RO and Post-treatment Systems - Operation and Performance Monitoring

09:00 – 10:30 RO System Performance Monitoring

- Key Parameters
- Data Collection
- Data Analysis and Normalization
- Performance Projections

10:30 – 10:45 Coffee Break

10:45 – 12:00 RO Membrane Flushing and Preservation

- Off-line, Return-to-Service and Stand-by Flush
- Membrane Preservation

12:00 – 13:00 Lunch Break

13:00 – 14:30 RO Membrane Cleaning

- Cleaning System Components and Function
- Criteria for Membrane Cleaning
- Cleaning Chemicals
- Cleaning Procedures

14:30 – 14:45 Coffee Break

14:45 – 15:00 RO Membrane Rotation and Replacement

- Purpose
- Criteria for Initiation of Rotation
- Rotation Schedule
- Purpose & Criteria for Initiation of Replacement
- Replacement Schedule

15:00 – 16:30 RO Post-treatment Operation and Monitoring

- Process and Equipment Monitoring
- Operational Adjustments

15:30 – 16:00 Questions & Discussions

Day 3: Troubleshooting and Optimization of Plant Operations

09:00 – 10:15 DAF and Pretreatment Filters

- Potential Challenges
- Troubleshooting and Optimization Practices

10:15 – 10:30 Coffee Break

10:30 – 12:00 RO Membrane System Diagnostics

- Factors Affecting Performance
- Potential Challenges and Their Causes
- Visual Inspection
- Vessel Profiling and Probing
- Membrane Autopsy

12:00 – 13:00 Lunch Break

13:00 – 14:30 RO System Troubleshooting and Optimization

- Controlling Membrane Integrity Challenges
- Controlling Biofouling
- Controlling Membrane Scaling

14:30 – 14:45 Coffee Break

14:45 – 15:30 Post-treatment System Performance Optimization

- Finished Water Turbidity Minimization
- Chemical Use Optimization
- Alkalinity – pH Control

15:30 – 16:00 Questions & Discussions

16:00 – 17:00 Multiple Choice Test and Adjourn
