

Desalination Technologies and Plant Operations

Course general description:

Comprehensive training on desalination processes, focusing on thermal and membrane technologies, plant operations, troubleshooting, and optimization. Combines theoretical knowledge with practical applications.

Audience:

This course is designed for:

1. Plant operators
2. Process engineers
3. Maintenance personnel
4. Project managers
5. Design engineers
6. Water treatment specialists
7. Technical supervisors.

Course objectives:

Upon completion, participants will be able to:

1. Master desalination principles and technologies
2. Understand plant operations and control
3. Optimize system performance
4. Implement maintenance strategies
5. Ensure cost-effective operations
6. Apply troubleshooting techniques

Course duration:

5 days

Course location:

Dubai

Course contents:

Day-1

- Pretest
- Introduction to desalination principles and water chemistry basics.
- Exploration of pre-treatment processes and feed water analysis.
- Overview of thermal desalination methods, including MSF, MED, and vapor compression.
- Fundamentals of membrane desalination, focusing on RO principles, membrane types, and system components.

Day-2

- Configuring desalination plants and determining design parameters and energy requirements.
- Designing pre-treatment and post-treatment systems, including chemical dosing and materials selection.
- Optimizing processes with energy recovery, hybrid systems, and effective plant layouts.

Day-3

- Procedures for plant start-up, shutdown, and monitoring operating parameters.
- Implementing control systems, instrumentation, and data analysis for quality control.
- Techniques for membrane cleaning, chemical treatments, and controlling scaling and fouling.

Day-4

- Preventive maintenance, equipment inspection, and troubleshooting strategies.

- Conducting membrane autopsies, failure analysis, and repair procedures.
- Managing spare parts, optimizing costs, improving energy efficiency, and ensuring safety.
- **Day-5**
- Insights into emerging desalination technologies and plant economics.
- Real-world case studies illustrating advanced applications.
- Course conclusion with a final assessment to reinforce learning outcomes.

Methodology:

- 50% lectures & concepts
- 10% Videos
- 15% Case studies
- 15% Exercises
- 10% Discussions

Course code: (TPRS053)