

**Training Title**

**SEA WATER DESALINATION**

**Training Duration**

**5 days**

**Training Dates & Venue**

REF			28 June - 2 July		
PE010	Sea Water Desalination	5	2020	\$4,500	Dubai, UAE

Training will be held at any of the 5 star hotels. The exact venue will be informed once finalized.

**Training Fees**

- 4,500 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

In this course the various thermal and membrane desalination technologies in practice will be covered; Multi-Stage Desalination (MSF), Multi-Effect Distillation (MED), Mechanical Vapor Compression (MVC), Thermal Vapor Compression (TVC), Reverse Osmosis (RO) and Electro dialysis (ED). The basic principles, material and thermal analysis, equipment used, and current practice for each of the desalination processes will be discussed. The course will give the major design equations. Problems facing each process such as corrosion, energy consumption, fouling and scaling will be presented. Energy and economic comparison among the different desalination processes will be given.

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**TRAINING OBJECTIVES**

- To provide the background knowledge needed to design, operate and maintain the sea water treatment processes used for heating and cooling applications at peak efficiency with minimal deratings or outages.
- Thermal Desalination Processes
- Membrane Separation Processes, Discuss membrane elements and reverse osmosis configuration
- Desalination Economics.
- Strategic Issues in Desalination Technology Capacity Building.
- Renewable Energy Desalination Technologies

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- Recent Trends and Expected Future Developments in Water
- Desalination Technologies

### WHO SHOULD ATTEND?

This seminar is aimed at engineers, scientists and technologists involved in the planning, management and operation of water desalination technology and also for manufacturers, consultants, designers, researchers, water personnel, Water treatment ,boiler plant operators and supervisors, responsible for plant utilities, energy conservation and environmental engineers; managers and operators for industrial processes using steam and/or cooling water; managers and operators of combined cycle generating plants; technical representatives for chemical treatment and service companies; technical representatives for companies.

### TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. All presentations are made in excellent colorful power point. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

### TOPICS COVERED

- Introduction to thermal desalination processes
- Multi stage flash (MSF) desalting system: basic principles, thermal analysis, equipment used, and current practice
- Conventional single and multi-effect (ME) desalination processes: basic principles, thermal analysis, and equipment used
- Mechanical vapor compression (MVC) desalting system (single and multi effect arrangement): process design, thermal analysis, present status, and equipment selection
- Thermal vapor compression (TVC) (single and multi effect arrangement): process design and thermal analysis
- Thermal Vapor Compression (TVC) or Thermo Compression Distillation (TCD) is considered as an efficient technique to produce distilled water without rotating parts like Mechanical compression.

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- **Multi-Effect Distillation (MED) desalination technologies can utilize both of Thermal Vapor Compression (TVC) or Mechanical Vapor Compression (MVC).**
- **Introduction to membrane desalination processes**
- **Post-treatment in thermal and membrane systems**

### **COURSE AGENDA**

Section 1:

**Water Resources & Properties (Water Chemistry parameters).**

**Saline water characteristics, Optimization of sea water intake**

**Analyzing quality of desalinated water**

Section 2:

**Heat & Mass Transfer associated with thermal desalination.**

Section 3:

**Water Desalination technologies. (Brief description of all type of**

**Desalination plant Focus in Thermal Compressor Distillate TCD.**

**MED, MED-TVC; Fundamentals, Main Components, Configurations**

Section 4:

**Working Principle and it Auxiliary System of Thermal compressor**

**Distillate TCD.**

Section 5:

**Common Chemical been Used and it function for Thermal**

**Compressor Distillate TCD (AS general)**

Section 6:

**Start up, shut down& Trouble shooting of Thermal compressor**

**Distillate TCD (AS General discussion).**

Section 7:

**Thermal Vapor Compression Process Technologies (TVC)**

Section 8:

**MED-TVC Performance**

Section 9:

**Combined Heat, Power and MED-TVC**

Section 10:

**Scaling, Fouling & Corrosion**

Section 11:

**Material Selection and Lifetime Expectancy**

Section 12:

**Operation and Maintenance of MED-TVC**

Section 13:

**Process Comparison with respect to primary energy**

Section 14:

**Post Treatment Technologies**

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**TRAINING OUTCOME**

- Upon completion of the course, participants will be able to:
- The basics of sea water chemistry
- How to monitor and control corrosion, scale, and bacterial growth in produced water and water injection/disposal systems
- How to implement system surveillance programs to detect
- Potential problems before system damage occurs
- How to use the knowledge gained to identify typical system
- Problems and be able to propose solutions

**NOTE:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Discussions, Last Day Review, Assessments will be carried out.**



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