

COURSE OVERVIEW TE0145 Water Treatment for Plant Utilities, Offsites and Cogeneration

Course Title

Water Treatment for Plant Utilities, Offsites and Cogeneration

Course Date/Venue

Please refer to page number 2

Course Reference

TE0145

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description









This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

Water is one of the most essential and abundant resources in nature. Three quarters of the earth's surface is covered with water. Pure water is colorless, odorless, and tasteless. Pure water is actually a rarity in nature. Oceans, rivers, lakes and underground water contain varying amounts of impurities picked up from the earth as well as dissolved gases picked up from the atmosphere. The impurities present in a water supply can cause many problems when that water is used in industrial or commercial heating and cooling systems.

Plant utilities or offsites are a vital service to the operation of most major industrial plants. Unfortunately, they are all too often ignored until they cause problems. It's too late to start thinking about them when the plant gets hit with a major derating or outage that could have been avoided. This course is a must for the key personnel in any industry that requires reliable sources of water and control of its usage for process applications, cooling water and steam production.

This course is designed to provide the background knowledge needed to design, operate and maintain the water treatment processes used for heating, cooling and process applications at peak efficiency with minimal deratings or outages.

The course will concentrate on **Reverse Osmosis (RO)** water treatment system. However, other water treatment systems will be discussed.



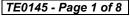


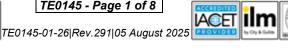






















Course Objectives

Upon the successful completion of this course, each participant will be able to: -

- Apply and gain an in-depth knowledge on water treatment for plant utilities, offsites and cogeneration
- Determine the importance, role & use of alkalinity in water treatment as well as the features of dissolved oxygen
- Carryout external treatment for boiler applications and review & employ reverse osmosis (RO) membrane desalination to plant utilities, offsites & cogeneration
- Recognize the role & application of Reverse Osmosis (RO) technology and design of reverse osmosis systems
- Describe the step-by-step process and perform monitoring of internal treatment operation
- Enumerate cooling water treatment program requirements and determine the three critical points to consider in the operation of any cooling system
- Discuss cooling system designs and emphasize the role of water treatment
- Identify the parts of the selected cooling systems including its features & functions
- Conduct performance monitoring and improve in-service cleaning including chemical & mechanical methods for both off-line on-line cleaning

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive "Haward Smart Training Kit" (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes electronic version of the course materials conveniently saved in a Tablet PC.

Who Should Attend

This course provides an overview of all significant aspects and considerations of water treatment for plant utilities, offsites and cogeneration for utility engineers, water treatment engineers, chemists, boiler plant engineers and designers responsible for plant utilities; energy conservation and environmental engineers; managers and other technical staff who are using steam and/or cooling water for industrial processes; managers and other technical staff of combined cycle generating plants; technical representatives for chemical treatment and service companies and for companies that are involved in the manufacture or sales of boilers, heat exchangers, cooling towers and related instruments.

Course Date/Venue

Session(s)	Date	Venue
1	January 26-30, 2026	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	April 26-30, 2026	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA
3	July 26-30, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	November 22-26, 2026	Safir Meeting Room, Divan Istanbul, Taksim, Turkey













Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Haward's Certificates are accredited by the following international accreditation organizations:



British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

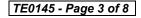
Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.















Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Kyle Bester is a Senior Water Engineer with extensive years of practical experience within the Oil & Gas, Power & Water Utilities and other Energy sectors. His expertise includes Water Reservoir, Water Tanks, Water Pumping Station, Water Distribution System, Water Network System, Water Pipes & Fittings, Water Hydraulic Modelling, Water Storage Reservoir, Reservoirs & Pumping Stations Design & Operation, Pumping Systems, Interconnecting Pipelines, Water

Network Hydraulic Simulation Modelling, Water Supply Design, Water Balance Modelling, Water Distribution Network, Water Network System Analysis, Water Forecasts Demand, Water Pipelines Materials & Fittings, Water Network System Design, Pump Houses & Booster Pumping Stations, Potable Water Transmission, Water Distribution Network, Districts Meters Areas (DMAs), Water Supply & Desalination Plants Rehabilitation, Water Reservoirs & Pumping Stations, Water Network System Extension, Water Network System Replacement & Upgrade, Water Networks Optimization, Water Supply & Distribution Systems Efficiency & Effectiveness, Pipe Materials & Fittings, Service Reservoir Design & Operation, Pipes & Fittings, Water Network System Design & Operation, Supply Water Network Rehabilitation, Water Loss Reduction, Main Water System Construction, Main Water Line Construction, Transmission & Distribution Pipelines, Water Distribution Design & Modelling, Water Supply System, Oilfield Water Treatment, Best Practice in Sewage & Industrial Wastewater Treatment & Environmental Protection, Water Distribution Design & Modelling, Desilting, Treating & Handling Oily Water, Water Chemistry for Power Plant, Water Sector Orientation, Environmental Impact Assessment (EIA), Potable Water, Reverse Osmosis Treatment Technology and Chlorination System, Well Inventory, Monitoring & Conservation, Qualitative Analysis of Soil & Ground Water, Water Networking, Hydraulic Modelling Systems, Pumping Stations, Centrifugal Pumps, Pipelines & Pumping, Water Reservoirs, Water Storage Tanks, Extended Activated Sludge Treatment, Sewage & Industrial Wastewater Treatment & Environmental Protection, Supervising & Monitoring Sewage Works, Water Desalination Technologies, Water Distribution & Pump Station, Best Water Equipment Selection & Inspection, Hydraulic Modelling for Water Network Design, Water Utility Industry, Water Desalination Technologies & New Development, Water Hydrology, Water Conveyors, Water Networks Rehabilitation. He is currently the Part Owner & Manager of Extreme Water SA wherein he manages, re-designed and commissioned a water and wastewater treatment plants.

During his career life, Mr. Bester has gained his practical and field experience through his various significant positions and dedication as the Project Manager, Asset Manager, Manager, Water Engineer, Supervisor, Team Leader, Analyst, Process Technician, Landscape Designer and Senior Instructor/Trainer for various international companies, infrastructures, water and wastewater treatment plants from New Zealand, UK, Samoa, Zimbabwe and South Africa, just to name a few.

Mr. Bester holds a Diploma in Wastewater Treatment and a National Certificate in Wastewater & Water Treatment. Further, he is a Certified Instructor/Trainer, an Approved Chemical Handler and has delivered numerous courses, trainings, conferences, seminars and workshops internationally.























Course Fee

Abu Dhabi/Al Khobar/ Dubai	US\$ 5,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	US\$ 6,000 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Training Methodology

All our Courses are including Hands-on Practical Sessions using equipment, Stateof-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30%	Lectures
20%	Practical Workshops & Work Presentations
30%	Hands-on Practical Exercises & Case Studies
20%	Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 - 0800	Registration & Coffee
0800 - 0815	Welcome & Introduction
0815 - 0830	PRE-TEST
0830 - 0930	Introduction to Water Chemistry and Technology Hydrological Cycle • Water Demand • Resources (Types) • Well Sources & Ground Water • Physical Properties • Chemical Properties • Biological Properties • Water Treatment • Separation • Oxidation • Biodegradation • Disinfection • Water Distribution • Water Analysis, Water Biology & Chemistry • Water Suspended Solids, Turbidity & SDI Use • Standardization & Normalization
0930 - 0945	Break
0945 - 1100	Boiler Design and the Role of Water Treatment Three Critical Points to Consider in the Operation of Any Boiler Plant • The Various Classes of Boilers and their Special Needs • The Boiler as a Concentrating Mechanism • Guidelines and Needs for Different Pressures • Components of the Water Treatment System
1100 - 1230	Alkalinity Why do we Need Alkalinity Control and How do we Apply it? • Coping with the Mixed Metallurgy that Minimized the Original Capital Cost
1230 - 1245	Break











1245 - 1420	Dissolved Oxygen
	Oxygen is the Food for Corroding Carbon Steel • Mechanical Versus Chemical
	Methods for Removing Dissolved Oxygen • Oxygenating Chemistry: Is it a
	Contradiction or a Better Way?
1420 - 1430	Recap
	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Topics that were Discussed Today and Advise Them of the Topics to be Discussed
	Tomorrow
1430	Lunch & End of Day One

Day 2	
	External Treatment
	How to Make it Suitable for Boiler Applications • How is the Choice of Equipment
0730 - 0930	Related to the Overall Plant Design • Do the Attendees' Plants Have any Special
	Problems? • Understand the Importance of Providing Safe, Treated Water for
	Domestic Use
0930 - 0945	Break
	Basic Fundamentals of Water Reuse & Desalination
0945 - 1100	Basic Elements of Risks, Epidemiology & Sustainability as they Related to Water •
	Basics of Water, Hydrological Cycle & Water Quality
	Reverse Osmosis (RO) Membrane Desalination
	Basic Principles of MF and UF • Fouling of UF and MF Systems • Cleaning of MF
1100 - 1230	and UF Systems • Reverse Osmosis Water Treatment System • Basic Principles of
	Reverse Osmosis Technology • Design Basis of Reverse Osmosis Systems • Overview
	RO and NF Membranes • Fouling in RO and NF Systems
1230 - 1245	Break
	Reverse Osmosis (RO) Membrane Desalination (cont'd)
1245 - 1420	Pretreatment for RO and NF Systems • Postreatment for RO and NF Systems •
1243 - 1420	Operation & Maintenance of RO • Concentrate Disposal in Brackish and SWRO •
	Comparison of Membrane and Distillation
1420 - 1430	Recap
	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Topics that were Discussed Today and Advise Them of the Topics to be Discussed
	Tomorrow
1430	Lunch & End of Day Two

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Day 3	
	Internal Treatment
	Once the Water is in the Boiler, How is it Maintained in the Best State to Keep the Boiler
0720 0020	Operating Reliably and Efficiently During Steady-State Operation? • What can
0730 - 0930	Happen During Start-Up, Shutdown and Transient Conditions? • What Happens
	when Contamination is Carried over with the Steam or Brought Back From the Process?
	Monitoring the Operation
0930 - 0945	Break
	Workshop on External Vs. Internal Treatment
0945 - 1100	What is the Best Choice for Different Applications, E.G., Cogeneration, SAGD Recovery
	of Heavy Oils or Heating a Distillation Column
1145 - 1230	Workshop on Specific Applications
1230 - 1245	Break











1245 - 1420	Cooling Water Treatment Program Requirement Three Critical Points to Consider in the Operation of any Cooling System
1420 - 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Three

Day 4

Day 4	
0730 - 0930	Cooling System Designs and the Role of Water Treatment
	Contact and Non-Contact Cleaning • Once-Through Cleaning
0930 - 0945	Break
0045 1100	Cooling System Designs and the Role of Water Treatment (cont'd)
0945 – 1100	Recirculating or Cooling Tower Systems • Closed Loop Recirculating Systems
	Workshop on the Treatment of Cooling System
1100 - 1230	Scaling and Scale Control • Evaluation & Scaling Potential • Microbiological
	Fouling and Corrosion • How to Calculate Chemical Consumption and Water Usage
1230 - 1245	Break
	Selected Cooling Systems
1245 - 1420	HVAC Systems (Optional) • Major Industrial Systems Including High and Low Heat
1243 - 1420	Load Systems, Direct Contact with Process Fluids and Closed Loops for Critical Systems
	• The Condenser in Electrical Generation Systems, Including Cogeneration
1420 - 1430	Recap
	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Topics that were Discussed Today and Advise Them of the Topics to be Discussed
	Tomorrow
1430	Lunch & End of Day Four

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Day J	
	Performance Analysis & Daily Monitoring
0730 - 0930	Can we Assess the Cleanliness of a Steam Condenser or HVAC Chiller Without
	Having to Shut Down and Open Them Up?
0930 - 0945	Break
	Performance Analysis & Daily Monitoring (cont'd)
0945 - 1100	Can we Assess the Cleanliness of a Steam Condenser or HVAC Chiller Without
	Having to Shut Down and Open Them Up? (cont'd)
1100 - 1230	Workshop on Monitoring Heat-Exchanger Cleanliness
1100 - 1230	The Specific Topics will be Chosen to Match the Needs of those Attending
1230 - 1245	Break
1245 1245	In-Service Cleaning
1245 - 1345	Chemical and Mechanical Methods for Both Off-Line On-Line Cleaning
	Course Conclusion
1345 - 1400	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Course Topics that were Covered During the Course
1400 - 1415	POST-TEST
1415 - 1430	Presentation of Course Certificates
1430	Lunch & End of Course





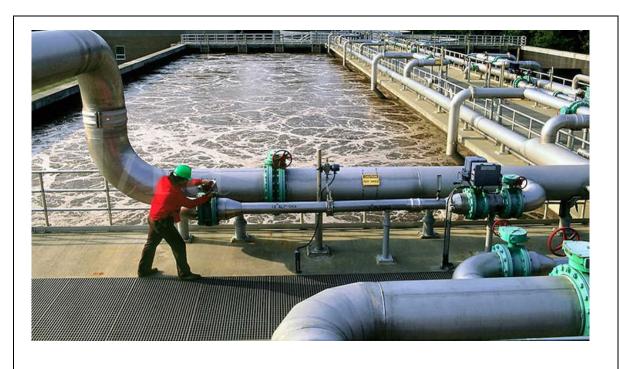








<u>Practical Sessions</u>
This practical and highly-interactive course includes real-life case studies and exercises:-



<u>Course Coordinator</u>
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