

COURSE OVERVIEW TE0145
Utilities Water Systems Operation

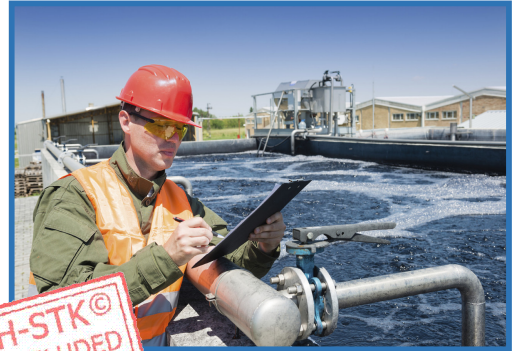
Course Title

Utilities Water Systems Operation

Course Date/Venue

Session 1: July 06-10, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Session 2: December 08-12, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE



H-STK[©] INCLUDED

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 “Howard 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 Certificate(s)


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

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. 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.

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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.

Course Fee

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.

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.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-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 & Technology Hydrological Cycle • Water Demand • Resources (Types) • Physical Properties • Chemical Properties • Biological Properties • Water Treatment • Separation • Oxidation • Biodegradation • Disinfection • Water Distribution
0930 - 0945	Break
0945 - 1100	Boiler Design & the Role of Water Treatment Three Critical Points to Consider in the Operation of Any Boiler Plant • The Various Classes of Boilers & their Special Needs • The Boiler as a Concentrating Mechanism • Guidelines & Needs for Different Pressures
1100 - 1230	Alkalinity Why do we Need Alkalinity Control & How do we Apply it? • Coping with the Mixed Metallurgy that Minimized the Original Capital Cost
1230 - 1245	Break
1245 - 1330	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?
1330 - 1420	External Treatment How to Make it Suitable for Boiler Applications • How is the Choice of Equipment Related to the Overall Plant Design • Do the Attendees' Plants Have any Special Problems?
1420 - 1430	Recap
1430	Lunch & End of Day One



Day 2

0730 - 0930	Reverse Osmosis (RO) Membrane Desalination Basic Principles of MF & UF • Fouling of UF & MF Systems • Cleaning of MF & UF Systems
0930 - 0945	Break
0945 - 1100	Reverse Osmosis (RO) Membrane Desalination (cont'd) Basic Principles of Reverse Osmosis Technology • Design of Reverse Osmosis Systems • Overview RO & NF Membranes
1230 - 1245	Break
1245 - 1330	Reverse Osmosis (RO) Membrane Desalination (cont'd) Fouling in RO & NF Systems • Pretreatment for RO & NF Systems • Posttreatment for RO & NF Systems
1330 - 1420	Reverse Osmosis (RO) Membrane Desalination (cont'd) Concentrate Disposal in Brackish & SWRO • Comparison of Membrane & Distillation
1420 - 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 - 0930	Internal Treatment Once the Water is in the Boiler, How is it Maintained in the Best State to Keep the Boiler Operating Reliably & Efficiently During Steady-State Operation? • What can Happen During Start-Up, Shutdown & Transient Conditions? • What Happens when Contamination is Carried over with the Steam or Brought Back From the Process? • Monitoring the Operation
0930 - 0945	Break
0945 - 1100	Workshop on External Vs. Internal Treatment 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
1430	Lunch & End of Day Three

Day 4

0730 - 0930	Cooling System Designs & the Role of Water Treatment Contact & Non-Contact Cleaning • Once-Through Cleaning
0930 - 0945	Break
0945 - 1100	Cooling System Designs & the Role of Water Treatment (cont'd) Recirculating or Cooling Tower Systems • Closed Loop Recirculating Systems
1100 - 1230	Workshop on the Treatment of Cooling System Scaling & Scale Control • Microbiological Fouling & Corrosion • How to Calculate Chemical Consumption & Water Usage
1230 - 1245	Break
1245 - 1420	Selected Cooling Systems HVAC Systems (Optional) • Major Industrial Systems Including High & Low Heat Load Systems, Direct Contact with Process Fluids & Closed Loops for Critical Systems • The Condenser in Electrical Generation Systems, Including Cogeneration
1420 - 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0930	Performance Monitoring <i>Can we Assess the Cleanliness of a Steam Condenser or HVAC Chiller Without Having to Shut Down & Open Them Up?</i>
0930 – 0945	Break
0945 – 1100	Performance Monitoring (cont'd) <i>Can we Assess the Cleanliness of a Steam Condenser or HVAC Chiller Without Having to Shut Down & Open Them Up? (cont'd)</i>
1100 - 1230	Workshop on Monitoring Heat-Exchanger Cleanliness <i>The Specific Topics will be Chosen to Match the Needs of those Attending</i>
1230 - 1245	Break
1245 - 1345	In-Service Cleaning <i>Chemical & Mechanical Methods for Both Off-Line On-Line Cleaning</i>
1345 - 1400	Course Conclusion
1400 - 1415	POST-TEST
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org