

COURSE OVERVIEW ME0599-4D
Cooling Towers: Selection, Operation & Maintenance

Course Title

Cooling Towers: Selection, Operation & Maintenance

Course Reference

ME0599-4D

Course Duration/Credits

Four days/2.4 CEUs/24 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	January 22-25, 2024	Jubail Hall, Signature Al Khobar Hotel, Al Khobar, KSA
2	March 04-07, 2024	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	June 24-27, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
4	September 23-26, 2024	Cheops Meeting Room, Radisson Blu Hotel, Istanbul Sisli, Turkey

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.



This course is designed to introduce the technology of cooling towers, show how cooling towers fit into the overall function of an industrial facility, and show the engineering principles employed by commonly used cooling towers. Participants will also get introduced to the methods used in designing cooling towers and discuss on common operation consideration such as estimating make-up water flow, etc.



At the completion of the course, participants will be able to evaluate the design, sizing, capacity control, placement and water make-up and losses of draught towers; interpret the performance variables, sea level, altitude and motor power of cooling towers; carry out the performance evaluation, commissioning, specifying and selection of cooling towers and the preparation of specification sheet for the cooling tower components; and evaluate and interpret water quality, corrosion, material and maintenance requirements of state of the art cooling towers.

Course Objectives

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

- Apply a comprehensive knowledge, applications, techniques and procedures on selection, operation and maintenance of cooling towers
- Discuss the different purpose, types and systems of cooling towers and analyze psychrometrics, heat and mass transfer
- Evaluate the design, sizing, capacity control, placement and water make-up and losses of draught towers
- Interpret the performance variables, sea level and altitude and motor power of cooling towers
- Carryout the performance evaluation, commissioning, specifying and selection of cooling towers and the preparation of specification sheet for the cooling tower components
- Evaluate and interpret water quality, corrosion, material and maintenance requirements of state of the art cooling towers

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 is intended for plant engineers, operation staff, supervisory personnel concerned with the selection, supervision, operation and maintenance of cooling towers and capital equipment for industrial, utility, institutional and commercial plants. Those involved in design engineering, field technical service and related problems solving will also benefit from this course.

Training Methodology

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Workshops & Work Presentations
- 30% Case Studies & Practical Exercises
- 20% Software, Simulators & Videos

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

Accommodation


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

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


Certificates are accredited by the following international accreditation organizations: -

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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 1-2013 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 1-2013 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

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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.

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. Karl Thanasis, PEng, MSc, MBA, BSc, is Senior Mechanical & Maintenance Engineer with over 45 years of extensive industrial experience. His wide expertise includes Piping & Pipeline, Maintenance, Repair, Shutdown, Turnaround & Outages, Maintenance & Reliability Management, Mechanical Maintenance Planning, Scheduling & Work Control, Advanced Techniques in Maintenance Management, Predictive & Preventive Maintenance, Maintenance & Operation Cost Reduction Techniques, Reliability

Centered Maintenance (RCM), Machinery Failure Analysis, Rotating Equipment Reliability Optimization & Continuous Improvement, Material Cataloguing, Mechanical & Rotating Equipment Troubleshooting & Maintenance, Root Cause Analysis & Reliability Improvement, Condition Monitoring, Root Cause Failure Analysis (RCFA), Steam Generation, Steam Turbines, Power Generator Plants, Gas Turbines, Combined Cycle Plants, Boilers, Process Fired Heaters, Air Preheaters, Induced Draft Fans, All Heaters Piping Work, Refractory Casting, Heater Fabrication, Thermal & Fired Heater Design, Heat Exchangers, Heat Transfer, Coolers, Power Plant Performance, Efficiency & Optimization, Storage Tank Design & Fabrication, Thermal Power Plant Management, Boiler & Steam System Management, Pump Operation & Maintenance, Chiller & Chiller Plant Design & Installation, Pressure Vessel, Safety Relief Valve Sizing & Selection, Valve Disassembling & Repair, Pressure Relief Devices (PSV), Hydraulic & Pneumatic Maintenance, Advanced Valve Technology, Pressure Vessel Design & Fabrication, Pumps, Turbo-Generator, Turbine Shaft Alignment, Lubrication, Mechanical Seals, Packing, Blowers, Bearing Installation, Couplings, Clutches and Gears. Further, he is also versed in Wastewater Treatment Technology, Networking System, Water Network Design, Industrial Water Treatment in Refineries & Petrochemical Plants, Piping System, Water Movement, Water Filtering, Mud Pumping, Sludge Treatment and Drying, Aerobic Process of Water Treatment that includes Aeration, Sedimentation and Chlorination Tanks. His strong background also includes Design and Sizing of all Waste Water Treatment Plant Associated Equipment such as Sludge Pumps, Filters, Metering Pumps, Aerators and Sludge Decanters.

Mr. Thanasis has acquired his thorough and practical experience as the **Project Manager, Plant Manager, Area Manager - Equipment Construction, Construction Superintendent, Project Engineer and Design Engineer.** His duties covered **Plant Preliminary Design, Plant Operation, Write-up of Capital Proposal, Investment Approval, Bid Evaluation, Technical Contract Write-up, Construction and Sub-contractor Follow up, Lab Analysis, Sludge Drying and Management of Sludge Odor and Removal.** He has worked in various companies worldwide in the **USA, Germany, England and Greece.**

Mr. Thanasis is a **Registered Professional Engineer** in the **USA and Greece** and has a **Master's and Bachelor's degree in Mechanical Engineering with Honours** from the **Purdue University and SIU in USA** respectively as well as an **MBA** from the **University of Phoenix in USA.** Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, seminars, workshops and conferences worldwide.

Course Fee

Al Khobar	US\$ 4,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	US\$ 4,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	US\$ 4,500 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\$ 5,000 per Delegate + VAT . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0900	Introduction to Cooling Towers
0900 – 0930	Purpose, Types & Systems
0930 – 0945	<i>Break</i>
0945 – 1100	Basic Theory & Psychrometrics
1100 – 1215	Heat & Mass Transfer
1215 – 1230	<i>Break</i>
1230 – 1300	Natural Draught Towers
1300 – 1330	Design Considerations
1330 – 1420	Tutorials
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	Sizing, Capacity Control & Placement
0830 – 0900	Water Make-up Losses
0900 – 0930	Tower Demand
0930 – 0945	<i>Break</i>
0945 – 1100	Motor Power
1100 – 1145	Packing & Pressure Drops
1145 – 1215	Performance Variables
1215 – 1230	<i>Break</i>
1230 – 1420	Tutorials
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

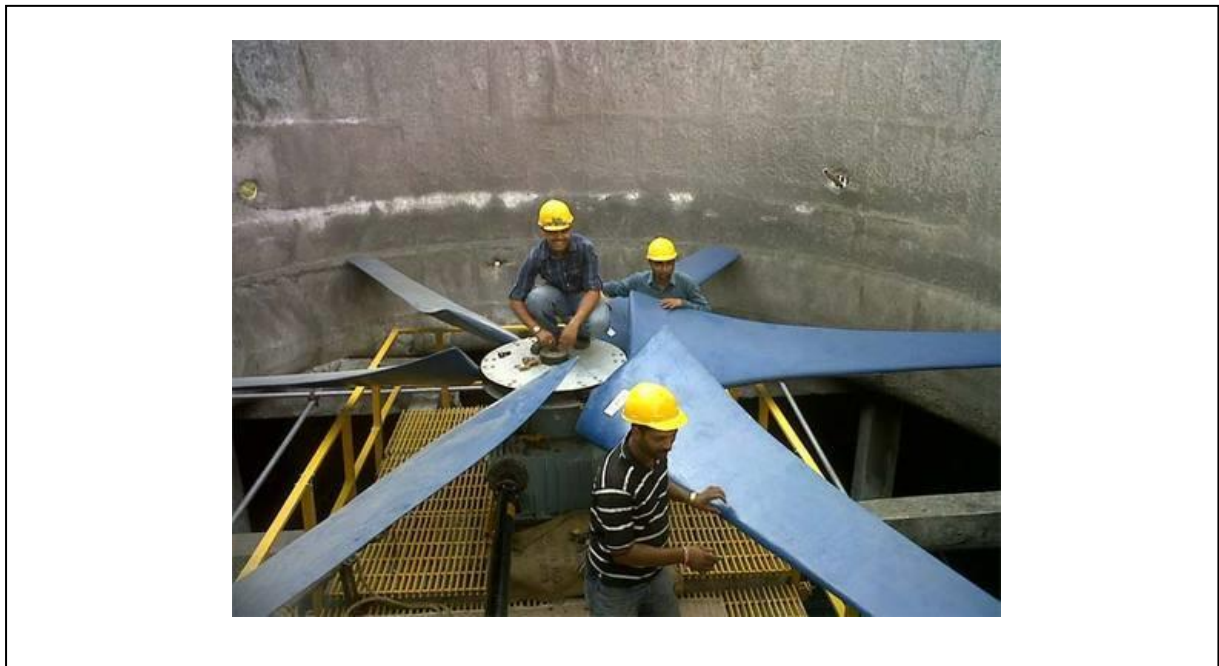
0730 – 0830	<i>Sea Level & Altitude</i>
0830 – 0930	<i>Performance Evaluation & Commissioning</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Comparison Between Theory & Practice</i>
1100 – 1215	<i>Specification & Selection</i>
1215 – 1230	<i>Break</i>
1230 – 1300	<i>Typical Specification Sheet</i>
1300 – 1330	<i>Discussion Regarding Practical Problems & Issues</i>
1330 – 1420	<i>Tutorials</i>
1420 – 1430	<i>Recap</i>
1430	<i>Lunch & End of Day Three</i>

Day 4

0730 – 0930	<i>Water Quality</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Corrosion Consideration & Material Selection</i>
1100 – 1215	<i>Maintenance Requirements</i>
1215 – 1230	<i>Break</i>
1230 – 1345	<i>State of the Art Towers</i>
1345 – 1400	<i>Course Conclusion</i>
1400 – 1415	<i>POST-TEST</i>
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

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