COURSE OVERVIEW ME0599
Cooling Towers: *Selection, Operation & Maintenance*

Course Title
Cooling Towers: *Selection, Operation & Maintenance*



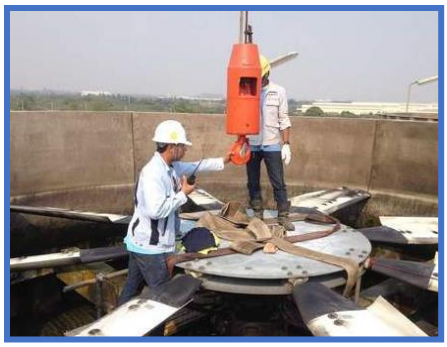
Course Date/Venue
Session 1: July 04-08, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar
Session 2: December 05-09, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Reference
ME0599



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.

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 introduce 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; carryout 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/Outcomes & Benefits for the Participants

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

Our courses employ an interactive, learner-centred methodology that integrates theoretical knowledge with practical application. The training is delivered through a suitable combination of some or all of the following methods, selected according to the course content and learning objectives:

- Instructor-led presentations and facilitated discussions
- Practical workshops and participant presentations
- Hands-on exercises and real-world case studies
- Equipment demonstrations and technical drawings
- Hardware- and software-based simulations
- Gamification & Role Play in soft-skills courses only
- Virtual Reality (VR) and Augmented Reality (AR)
- Instructional videos and other relevant training resources

This blended approach encourages active participation, strengthens practical skills and supports the effective application of acquired knowledge in the workplace.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

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.

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 Engineer** with over **30 years** of extensive industrial experience. His wide expertise includes **Energy Efficient Operation** of **District Cooling Plants**, **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**, **Chiller Equipment**, **Trane Chiller Diagnostics Troubleshooting**, **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, **Pumps & Compressors**, **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** and **Bachelor** degrees 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

US$ 6,000 per Delegate. 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 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 Cooling Towers***
0930 – 0945	*Break*
0945 – 1100	***Purpose, Types & Systems***
1100 – 1215	***Basic Theory & Psychrometrics***
1215 – 1230	*Break*
1230 – 1330	***Heat & Mass Transfer***
1330 – 1420	***Tutorials***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Natural Draught Towers***
0830 – 0930	***Design Considerations***
0930 – 0945	*Break*
0945 – 1100	***Sizing, Capacity Control & Placement***
1100 – 1215	***Water Make-up Losses***
1215 – 1230	*Break*
1230 – 1420	***Tutorials***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Tower Demand***
0830 – 0930	***Motor Power***
0930 – 0945	*Break*
0945 – 1100	***Packing & Pressure Drops***
1100 – 1215	***Performance Variables***
1215 – 1230	*Break*
1230 – 1330	***Sea Level & Altitude***
1330 – 1420	***Tutorials***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

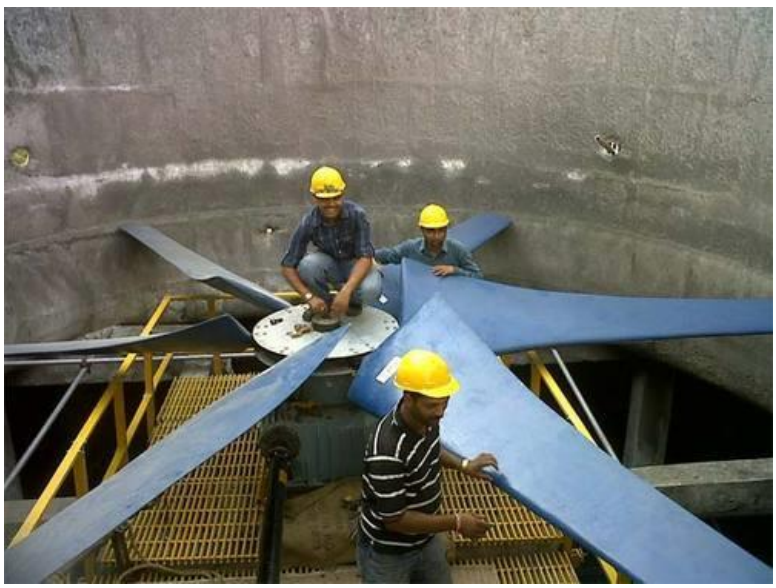
0730 – 0815	***Performance Evaluation & Commissioning***
0815 – 0900	***Comparison Between Theory & Practice***
0900 – 0915	*Break*
0915 – 0945	***Specification & Selection***
0945 – 1100	***Typical Specification Sheet***
1100 – 1245	***Discussion Regarding Practical Problems & Issues***
1245 – 1300	*Break*
1300 – 1420	***Discussion Regarding Practical Problems & Issues (cont'd)***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Water Quality***
0930 – 0945	*Break*
0945 – 1100	***Corrosion Consideration & Material Selection***
1100 – 1215	***Maintenance Requirements***
1215 – 1230	*Break*
1230 – 1345	***State of the Art Towers***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

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



Course Coordinator

Jaryl Castillo, Tel: +974 6652 9196, Email: jaryl@haward.org