COURSE OVERVIEW ME1138-3D
Steam Generation & Distribution Operations

Course Title
Steam Generation & Distribution Operations

Course Reference
ME1138-3D

Course Duration/Credits
Three days/1.8 CEUs/18 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	June 15-17, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	August 25-27, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	October 05-07, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	November 16-18, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

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 provide participants with a detailed and up-to-date overview of Steam Generation and Distribution Operations. It covers the basics of steam generation, boiler efficiency and performance and fuel types for steam generation; the boiler feed water treatment, steam generation equipment and safety in steam generation; the steam distribution, steam piping and insulation and steam pressure control; the function of steam traps, types of steam, importance of condensate recovery and common failures and maintenance of steam traps; and the automation in steam distribution, SCADA systems for steam management, control valve positioning and regulation and alarm systems and remote monitoring.

During this interactive course, participants will learn the energy recovery and efficiency in distribution, routine maintenance practices and troubleshooting steam generation issues; the pressure drops and blockages in piping, steam trap failures and effects on distribution; the corrective measures for distribution failures and advanced control strategies for steam systems; the system integration and optimization tools, steam demand forecasting and load management and automation; the sustainable steam generation technologies, waste heat recovery and CHP systems; reducing carbon footprint in steam operations; and the renewable energy integration into steam generation.

Course Objectives

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

- Apply and gain a comprehensive knowledge on steam generation and distribution operations
- Discuss the basics of steam generation, boiler efficiency and performance and fuel types for steam generation
- Apply boiler feed water treatment and identify steam generation equipment and safety in steam generation
- Recognize steam distribution, steam piping and insulation and steam pressure control
- Identify the function of steam traps, types of steam, importance of condensate recovery and common failures and maintenance of steam traps
- Discuss automation in steam distribution, SCADA systems for steam management, control valve positioning and regulation and alarm systems and remote monitoring
- Carryout energy recovery and efficiency in distribution, routine maintenance practices and troubleshooting steam generation issues
- Identify and fix steam leaks and discuss pressure drops and blockages in piping, steam trap failures and effects on distribution and corrective measures for distribution failures
- Employ advanced control strategies for steam systems, system integration and optimization tools, steam demand forecasting and load management and automation and AI in steam operations
- Recognize sustainable steam generation technologies, waste heat recovery and CHP systems
- Reduce carbon footprint in steam operations and renewable energy integration into steam generation

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 steam generation and distribution operations for mechanical engineers, supervisors, managers, boiler inspectors, contractors, operators, panel operators and other technical staff.

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:-

- 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.

- 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

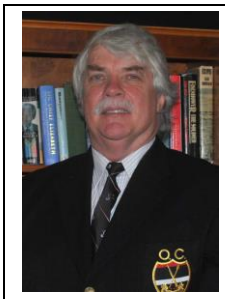
US$ 3,750 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

Course Instructor

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



Mr. Den Bazley, PE, BSc, is a **Senior Mechanical Engineer** with over **30 years** of industrial experience in **Oil**, **Gas**, **Refinery**, **Petrochemical**, **Power** and **Utilities** industries. His wide expertise includes **Pumps & Compressors** Maintenance & Troubleshooting, **Centrifugal Pump** Design, **Hydraulic Turbines**, Axial Flow **Compressor**, **Centrifugal Pump** Installation & Operation, **Centrifugal Pump** Maintenance & Troubleshooting, **Centrifugal & Positive Displacement Pump** Technology, **Pumps & Valves** Operation, **Bearings**, **Seals & Couplings**, **Compressors & Turbines** Maintenance & Troubleshooting, **Gas Turbine** Design & Maintenance, **Gas Turbine** Troubleshooting, **Pressure Vessel** Design, Fabrication & Testing, **Tank & Tank Farms**, **Heat Exchangers** Operation & Maintenance, **Boilers & Steam System** Management, Re-tubing & Tube Expanding Technology, Propylene **Compressor & Turbine**, **Valve** Installation & Repair, **Safety Relief Valve** Sizing & Troubleshooting, **Dry Gas Seal** Operation, **Mechanical Seal** Installation & Maintenance, Industrial Equipment & **Turbomachinery**, **Pumps**, **Compressors**, **Turbines & Motors**, **Boiler & Steam** System Management, Tune-Up, Heat Recovery & Optimization, **Bearing & Lubrication**, Installation & Failure Analysis, **Boiler** Operation & Maintenance, Process **Control Valves**, **Steam Turbine** Operation, **Bearing** Mounting/Dismounting, **Valve** Types, Troubleshooting & Repair Procedure, **Pressure Vessels & Heat Exchangers**, **Corrosion** Inspection, **PSV** Maintenance & Testing, **Pump** Maintenance, Machinery Troubleshooting, **Valves**, **Safety Relief Valves**, Strainers & Steam Traps, **Pipeline Rules of Thumb**, Analytical Prevention of Mechanical Failure, **Gear Boxes** Troubleshooting & Repair, **Piping & Pipeline** Design & Inspection, **Pigging** & Integrity Assessment, Process Piping Design, **Pipeline** Operation & Maintenance, **Welding & Fabrication**, **Brazing**, Fitness-for-Service (**FFS**), **Process Plant** Equipment, **Pressure Vessels**, Piping & Storage Facilities, Layout of **Piping Systems & Process Equipment**, **Pipe Work** Design & Fabrication, Mechanical Integrity & Reliability, Mechanical **Rotating Equipment & Turbomachinery**, **Motors & Variable Speed Drives**, Mechanical Engineering Design, **Process Plant Shutdown**, Turnaround & Troubleshooting, **Mechanical Alignment**, **Laser & Dial-Indicator** Techniques, **Material Cataloguing**, **Condition Based** Monitoring, **Maintenance** Management, **Reliability** Management, Reliability Centred Maintenance (**RCM**), Total Plant Maintenance (**TPM**) and Reliability-Availability-Maintainability (**RAM**), **Engineering Drawings, Codes & Standards**, **P&ID Reading, Interpretation & Developing**, **Maintenance & Reliability** Best Practices, **Maintenance** Auditing, **Benchmarking & Performance** Improvement, Excellence in **Maintenance & Reliability** Management, **Preventive & Predictive** Maintenance & Machinery Failure Analysis (**RCFA**), Total Plant Reliability Centered Maintenance (**RCM**), Rotating Equipment Reliability Optimization, Machinery Failure Analysis, Prevention & Troubleshooting, **Maintenance** Planning, Scheduling & Work Control and **Maintenance Planning & Cost** Estimation.

During his career life, Mr. Bazley has gained his practical and field experience through his various significant positions and dedication as the **General Manager**, **Branch Manager**, **Refinery Chairman**, **Engineering Manager**, **Maintenance Engineer**, **Construction Engineer**, **Project Engineer**, **Mechanical Engineer**, **Associate Engineer**, **Oil Process Engineer**, **Mechanical Services Superintendent**, **Quality Coordinator**, **Planning Coordinator**, **Consultant/Instructor**, **Lecturer/Trainer** and **Public Relations Officer** for numerous international companies like **ESSO**, **FFS Refinery**, Dorbyl Heavy Engineering (**VECOR**), Vandenbergh Foods (**Unilever**), **Engen Petroleum**, Royle Trust and **Pepsi-Cola**.

Mr. Bazley is a **Registered Professional Engineer** and has a **Bachelor** degree in **Mechanical Engineering**. Further, he is a **Certified Engineer** (Government Certificate of Competency GCC Mechanical Pretoria), a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management** (**ILM**), an active member of the **Institute of Mechanical Engineers** (**IMechE**) and has delivered numerous trainings, courses, 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	***Basics of Steam Generation*** *Definition & Importance of Steam in Refining • Types of Boilers (Fire-tube, Water-tube) • Components of Steam Generation System • Pressure & Temperature Control in Boilers*
0930 – 0945	*Break*
0945 – 1030	***Boiler Efficiency & Performance*** *Boiler Efficiency Factors • Heat Transfer in Boilers • Methods for Improving Boiler Efficiency • Common Boiler Performance Issues*
1030 – 1130	***Fuel Types for Steam Generation*** *Fossil Fuels: Natural Gas, Diesel, Coal • Renewable & Alternative Fuels • Selecting Fuel for Refinery Boilers • Fuel Combustion & Environmental Considerations*
1130 – 1230	***Boiler Feed Water Treatment*** *Importance of Feed Water Quality • Types of Feed Water Treatment (Deaeration, Filtration) • Chemical Treatment Methods • Monitoring & Maintaining Water Quality*
1230 – 1245	*Break*
1245 – 1330	***Steam Generation Equipment*** *Burners, Combustion Chamber, & Heat Exchangers • Feed Water Pumps & Valves • Pressure Reducing Valves • Control Systems for Steam Generation Equipment*
1330 – 1420	***Safety in Steam Generation*** *Steam Boiler Safety Devices • Pressure Relief Valves & Safety Valves • Boiler Explosion Risks & Prevention • Safety Procedures for Boiler Start-up & Shutdown*
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

0730 – 0830	***Basics of Steam Distribution*** *Overview of Steam Distribution Systems • Types of Steam Headers & Piping • Steam Flow & Pressure Control • Steam Leak Prevention & Maintenance*
0830 – 0930	***Steam Piping & Insulation*** *Materials Used in Steam Piping • Sizing & Layout of Steam Piping • Insulation of Steam Piping • Maintaining Insulation Integrity*
0930 – 0945	*Break*
0945 – 1045	***Steam Pressure Control*** *Pressure Reducing Stations • Pressure Control Valves & Regulators • Monitoring & Adjusting Steam Pressure • Effects of Pressure Variations on Refinery Equipment*
1045 – 1200	***Steam Traps & Condensate Management*** *Function of Steam Traps • Types of Steam Traps (Mechanical, Thermodynamic) • Importance of Condensate Recovery • Common Failures & Maintenance of Steam Traps*
1200 – 1215	*Break*
1215 – 1330	***Steam Distribution Control Systems*** *Automation in Steam Distribution • SCADA Systems for Steam Management • Control Valve Positioning & Regulation • Alarm Systems & Remote Monitoring*
1330 – 1420	***Energy Recovery & Efficiency in Distribution*** *Heat Recovery from Steam Systems • Waste Heat Boilers & Economizers • Optimization of Steam Flow & Energy Consumption • Implementing Energy Management Programs*
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*

Day 3

0730 – 0830	***Routine Maintenance Practices*** *Boiler Inspections & Preventive Maintenance • Pressure & Temperature Calibration • Cleaning & Descaling of Boilers • Maintenance Checklists & Schedules*
0830 – 0930	***Troubleshooting Steam Generation Issues*** *Diagnosing Boiler Failures (Leaks, Scaling, Corrosion) • Common Steam Generation Problems (Low Pressure, Fluctuating Levels) • Tools for Steam System Troubleshooting • Case Studies of Steam Generation Failures*
0930 - 0945	*Break*
0945 – 1130	***Troubleshooting Steam Distribution Issues*** *Identifying & Fixing Steam Leaks • Pressure Drops & Blockages in Piping • Steam Trap Failures & Effects on Distribution • Corrective Measures for Distribution Failures*
1130 - 1230	***Advanced Steam System Optimization*** *Advanced Control Strategies for Steam Systems • System Integration & Optimization Tools • Steam Demand Forecasting & Load Management • Automation & AI in Steam Operations*
1230 - 1245	*Break*

1245 – 1345	***Energy Saving & Sustainable Practices*** *Sustainable Steam Generation Technologies • Waste Heat Recovery & CHP Systems • Reducing Carbon Footprint in Steam Operations • Renewable Energy Integration into Steam Generation*
1345 – 1400	***Course Conclusion*** *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*

Practical Sessions

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

Course Coordinator

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