



COURSE OVERVIEW ME0688 Boiler Control & Burners Management System

Course Title

Boiler Control & Burners Management System

Course Date/Venue

Session 1: May 25-29, 2025/Boardroom 1,
Elite Byblos Hotel Al Barsha,
Sheikh Zayed Road, Dubai, UAE

Session 2: November 03-07, 2025/Fujairah
Meeting Room, Grand
Millennium Al Wahda Hotel,
Abu Dhabi, UAE



Course Reference

ME0688

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using one of our state-of-the-art simulators.

The course is designed to provide participants with a detailed and up-to-date knowledge on Boiler Control & Management System. Participants will be trained in the practical aspects of boiler burner management system (BMS) to assure safe operation of the combustion associated with boilers.



The course will cover the hazard and risk of combustion; the safety functions of combustion systems; the function and purpose of BMS; the BMS operation and safety requirement; the international standards (NFPA, ISA, IEC) and regulation requirement for BMS; the SIL requirement for BMS; the BMS logic and program; the PLC operation (for BMS logic & program); the boiler instrumentation for protection and control; the boiler start-up and shutdown sequence; the boiler purge and leak test sequence and requirement; the boiler pilots and main burners operation; and the boiler flame scanner operation.



During this interactive course, participants will learn the shrink and swell effect phenomena in boiler's steam drum; the 3 and 5 element of boiler control; the difference of combustion control and feed water control; troubleshooting of problem if boiler operation is upset; troubleshooting and identifying the problem if boiler is trip and if the boiler start-up or purge/leak test sequence is stop/stuck; and the required documents for BMS and boiler operation.





Course Objectives

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

- Apply and gain a good working knowledge on boiler control and management system
- Discuss the hazard and risk of combustion including the safety functions of combustion systems
- Identify the function and purpose of BMS including its operation and safety requirement
- Discuss international standards (NFPA, ISA, IEC) and regulation requirement for BMS
- Recognize SIL requirement for BMS, BMS logic and program, PLC Operation (for BMS logic & program) and boiler instrumentation for protection and control
- Describe boiler start-up and shutdown sequence, boiler purge and leak test sequence and requirement
- Carryout boiler pilots and main burners operation including boiler flame scanner operation
- Discuss shrink and swell effect phenomena in Boiler's steam drum, 3 and 5 element boiler control and the difference of combustion control and feed water control
- Troubleshoot the problem if boiler operation is upset as well as troubleshoot and identify the problem if boiler is trip and if the boiler start-up or purge/leak test sequence is stop/stuck
- Identify required documents for BMS and boiler operation

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 a deeper appreciation and wide understanding of boiler control and management system for mechanical engineers, mechanical supervisors, utility engineers & supervisors, process engineers & supervisors and other technical staff involved in the boiler burner management and boiler operation.




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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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 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:



Dr. Maged Elhefnawey, PhD, MSc, BSc, ASNT-NDT, is a **Senior Mechanical & Maintenance Engineer** with **extensive years** of experience in **Insulation Inspection & Quality Control, Insulation Standards & Regulations, Thermal Insulation, Piping System Insulation, Pipeline & Piping Insulation, Insulation & Corrosion Protection, Insulation Maintenance & Repair, Heat Exchanger & Boiler Insulation, Insulation Installation Techniques, Insulation Thickness Calculation, Insulation Retrofitting, Insulation Materials & Selection, Insulation Testing & Quality Assurance, Tanks & Vessels Insulation, Heat Exchanger & Tank Farms, Pressure Relief Valve, Control Valves & Actuators, Compressor & Pumps Troubleshooting & Repair, Piping & Pipeline Maintenance, Boiler Operation & Maintenance, Flange Joint & Flange Management, Bolt Torquing, Vibration Analysis, Gas Transmission & Piping Distribution System (ASME B31.8), Material Selection Codes & Standards, Diesel Engine Operation & Maintenance, Pipe Stress Analysis, Rotating Equipment Inspection & Troubleshooting, Gas & Steam Turbine, Dry Gas Seal, Motors, Turbo-expanders, Gears, Blower & Fan, Vapor Recovery Unit System, Thermal Power Plant, Pressure Vessel Design & Fabrication, Hydraulic System Operation & Maintenance, Bearings & Lubrication, Roll Pass Design & Mill Operation, Furnace Operation & Troubleshooting, Fired Heater, Mechanical Equipment Installation, Piping & Pipe Support Systems, Welding Inspection, Coating Inspection, ASNT-NDT Techniques, Painting & Hydrotesting, Piping Fabrication & Assembly and Water Pipes Inspection & Repair.** He is also well-versed in **Maintenance Auditing & Benchmarking, Maintenance & Reliability Management, Equipment Failure Analysis, Rotating Equipment & Machinery, Material Cataloguing & Storage, Alignment & Balancing Techniques, Condition Monitoring, Machinery Failure Analysis, Reliability Centered Maintenance (RCM), Root Cause Analysis (RCA), Maintenance Planning & Scheduling, Physical Asset Management, Maintenance Cost Control, Prevention & Predictive Maintenance, Lubricant & Oil Analysis and Refinery Equipment Maintenance.**

During his career life, Dr. Maged has gained his expertise and thorough practical experience through several positions and dedication as the Acting **Department Head, Thermal Insulation Engineer, Section Head Projects Engineer, Mechanical Engineer, Maintenance Engineer, Mechanical Supervisor, Lecturer, Instructor/Trainer, Assistant Professor** and **Senior Thermal Insulation Technician** for various international companies and institutions such as the Gulf of Suez Petroleum Co. (GUPCO), British Petroleum (BP), BETROBEL, KNPC, SAIPEM Engineering, Natural Gas Pipeline, TRACTEBEL Engineering, Suez and TransGas Company to name a few. He also worked as **Mechanical/NDT Supervisor** wherein he was responsible for executing the scheduled inspections for welding, coating, pipeline, painting, hydrotest of pipeline & piping and fabrication and assembly.

Dr. Maged has a **PhD** and **Master's** degree in a **Certified API 580 Risk Based Inspection, a Certified API 570 Piping Inspector, a Certified API 510 Pressure Vessel Inspector, a Certified API 653 Aboveground Storage Tank Inspector, Mechanical Production Engineering** and a **Bachelor's** degree in **Mechanical Power Engineering**. Further, he is a **Certified ASNT Level II (RT-PT-MT & UT), Certified Instructor/Trainer, a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and further published numerous academic papers and delivered various trainings, courses, workshops, seminars and conferences worldwide.





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 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 Program

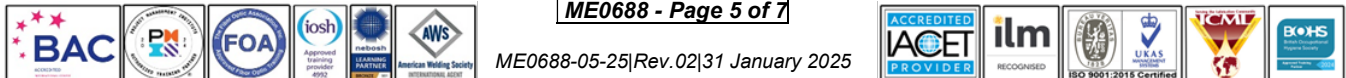
The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	Registration, Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Overview of Boiler Operation
0930 – 0945	Break
0945 – 1100	The Hazards of Combustion
1100 – 1230	Cause of Furnace/Boilers Explosion/Implosions
1230 – 1245	Break
1245 – 1330	Overview of Burner Management System (BMS)
1330 – 1420	BMS Operations Sequencing
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0930	BMS Interlocks/Safety Instrumented Functions (SIFs)
0930 – 0945	Break
0945 – 1100	How to Determine SIL for BMS Design
1100 – 1230	Flame Scanning Intelligence
1230 – 1245	Break
1245 – 1330	BMS Function Test & Requirement
1330 – 1420	International Standard & Regulation for Boiler Operation & Safety Requirement
1420 – 1430	Recap
1430	End of Day Two





Day 3

0730 – 0930	BMS Logic & P&IDs
0930 – 0945	<i>Break</i>
0945 – 1100	Boiler Instrumentation for Protection & Control
1100 – 1230	Boiler Start-Up & Shutdown
1230 – 1245	<i>Break</i>
1245 – 1330	Primary Shutdown as Defined by the National Fire Protection Association (NFPA) 85 Code
1330 – 1420	Pre-Firing Purge Requirements for Both Single-and-Multiple Boilers
1420 – 1430	Recap
1430	<i>Lunch & End of Day Three</i>

Day 4

0730 – 0930	Boiler Purge & Leak Test Requirement & Sequence
0930 – 0945	<i>Break</i>
0945 – 1100	Alarms, Interlocks and Emergency Shutdown System
1100 – 1230	Boiler Operation and Control
1230 – 1245	<i>Break</i>
1245 – 1330	3 and 5 Element Boiler Control
1330 – 1420	Boiler Maintenance & Troubleshooting
1420 – 1430	Recap
1430	<i>Lunch & End of Day Four</i>

Day 5

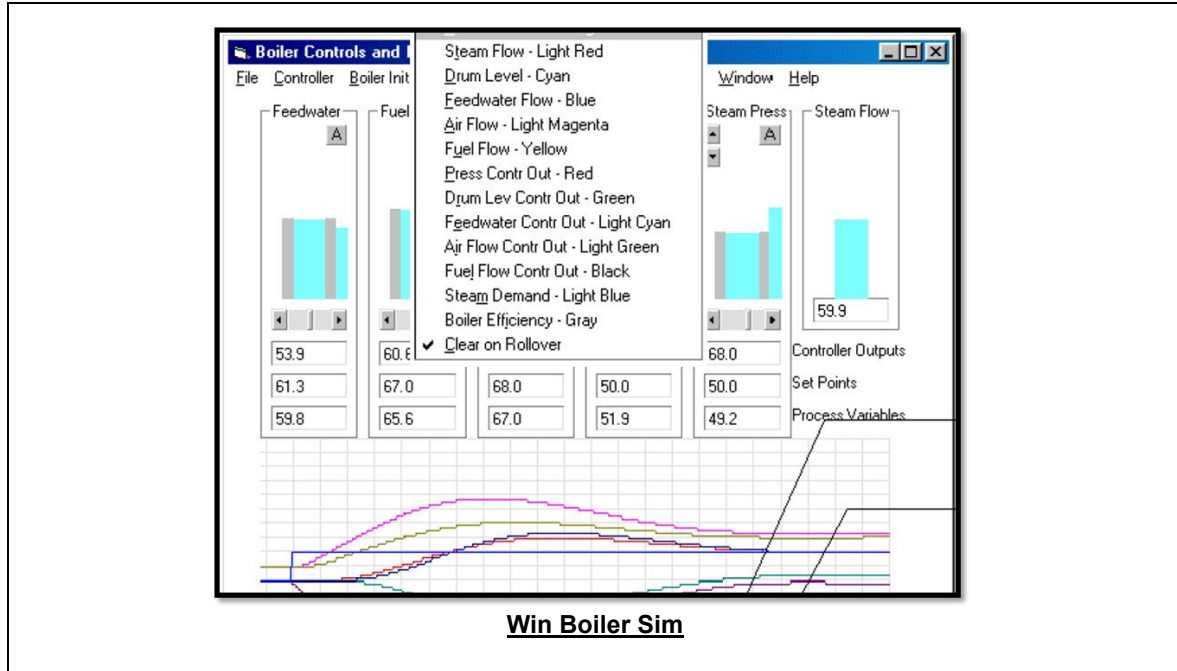
0730 – 0830	Documentation
0830 – 0930	Individual Safety Standards & How to Use them Appropriately
0930 – 0945	<i>Break</i>
0945 – 1100	NFPA 85 Boiler & Combustion Systems Hazards Code, Other Safety Related Standards & How they Apply to BMS
1100 – 1230	Quantitative Reliability Analysis of Burner Management Systems Interlocks
1230 – 1245	<i>Break</i>
1245 – 1345	Function Testing
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>





Simulator (Hands-on Practical Sessions)

Practical session will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulator “Win Boiler Sim”.



Course Coordinator

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