

COURSE OVERVIEW PE0385
Functions of Process Heater

Course Title

Functions of Process Heater

Course Date/Venue

Session 1: June 23-27, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: December 07-11, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference

PE0385



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 provide participants with a detailed and up-to-date overview of furnace operations and troubleshooting. It covers the various types and major parts of furnaces; the performance monitoring and optimization; the flame impingement, skin temperature, tube life, air requirement, heating value, draft and thermal efficiency; the burners F/G, F/O, combustion, NOX control and fuel specifications; the furnace initial startup after construction and furnace normal startup after shutdown; and the furnace explosion and implosion including furnace decoking procedure.



During this interactive course, participants will learn the systematic operation and troubleshooting; the reduced draft, excessive draft, optimizing draft and air leaks; the air supply, insufficient air and optimizing excess air combustion; the oxygen content, flame appearance and fin tube damage of flue gas; the convection and radiation saving energy; spotting a hot tube; and the coke deposition, cooling an overheated tube, heater accidents and safety concerns.

Course Objectives

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

- Apply and gain an in-depth knowledge on furnace operations and troubleshooting
- Discuss the various types of furnaces and major parts as well as performance monitoring and optimization
- Identify flame impingement, skin temperature, tube life, air requirement, heating value, draft and thermal efficiency
- Recognize burners F/G, F/O, major parts, combustion, NOX control, fuel specifications, gas and liquid
- Carryout furnace initial startup after construction and furnace normal startup after shutdown
- Avoid furnace explosion and implosion as well as apply furnace decoking procedure
- Employ systematic operation and troubleshooting and determine reduced draft, excessive draft, optimizing draft and air leaks
- Identify air supply combustion, insufficient air combustion and optimizing excess air combustion
- Discuss oxygen content, flame appearance and fin tube damage of flue gas
- Recognize convection and radiation saving energy
- Spot a hot tube and discuss coke deposition, cooling an overheated tube, heater accidents and safety concerns

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 production operation staff including process engineers, supervisors, foremen, technicians and operators. Further, the course is suitable for control, instrumentation and maintenance staff who are involved in furnaces and fired process heaters.

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 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:



Mr. Jamal Khaled is a **Senior Process & Petroleum Engineer** with over **25 years** of practical experience within the **Oil & Gas**, industry. His experience covers **Operation of Upstream & Midstream Process Facilities**, **Operation of Process Equipment** (Fired Heaters, Heat Exchangers, Air Coolers, Piping, Pumps, Compressors and Process Control & Troubleshooting), **Heat Exchanger Design**, Operation & Maintenance, **Surface Production Operations**, **Advanced Oil Wells**, Separation & Oil Treatment, Treatment of Oily Produced Water, **Gas Dehydration & Sweetening**, **Compressors & Utilities System**, **Flare & Disposal Systems** Operation & Troubleshooting, **Heat Exchangers**, **Fired Heaters**, **Process Plant Startup**, Commissioning & Troubleshooting, **Oil Movement Storage & Troubleshooting**, **Gas Compression & Foundation**, **Gas Compression Train** Operations & Maintenance, **Gas Dehydration (TEG)** Principles, Operations & Maintenance, **Gas Dehydration (Mole Sieve)** Operations & Maintenance, **Acid Gas Removal (AGRU)** Operations & Maintenance, **Gas Fractionation & Separation** Operations Principles & Practices, **Gas Processing** Chemical Treatment Principles, **Advanced Distillation** Operation, Control, Design & Troubleshooting, **Troubleshooting Process Operation & Problem Solving**, **Process Plant** Troubleshooting & Engineering Problem Solving, **Process Equipment** Operation, **Process Plant** Operation, **Process Plant** Optimization, **Oil & Gas Field** Operation, **Oil Movement**, Storage & Troubleshooting, **Petroleum Refinery** Process, **Process Reactor** Operation & Troubleshooting, **LNG & LPG** Plants Gas Processing, **Refinery Process** Operations Technology, **Distillation Column** Design & Operation, **Gasoline & Diesel Fuel** Technology, **Gas Sweetening & Sulfur Recovery**, **Gas Dehydration Units**, **Gas Sweetening Units**, **Fractionation Towers**, **Gas Compressors**, **Sulphur Recovery (SRU)** & Utilities, **Steam & Heat Recovery** Systems, **Flare & Pressure Relief Systems**, **NGL Recovery & Fractionation** and **Refrigerant & NGL Extraction**. Further, he is also well-versed in Oil & Gas **Producing Wells**, **Well Head Design & Selection** H₂S, Sour Gas Compatible Material **X-Mas Tree**, **Electrical Submersible Pumping (ESP)** Operations, Design & Troubleshooting, **Sucker Rod Pumping System** Application, Operation, Troubleshooting & Maintenance, **Well Integrity Management** System, **X-Mass Tree & Wellhead** Operation & Testing, **Artificial Lift Systems**, Selection & Operation, **Artificial Lift Surface Equipment**, **Advanced Stuck Pipe Prevention & Fishing** Operation, **Well Completion** Design & Operations, **Casing, Cementing & Fluid, Pipeline & Pigging** Operations, **HP/IP/LP** Separation, **Industrial Water Treatment** System & Operations, **H₂S**, **Confined Space Entry**, **Permit To Work (PTW)** and **Authorized Gas Tester**. He is currently the **On Job Instructor/Trainer** of Majnoon Oil Field.

During his career life, Mr. Jamal has gained his practical and field experience through his various significant positions and dedication as the **Oil & Gas Operation Instructor**, **OJT Operation Trainer**, **Operation & HSE Instructor**, **Operation & Competency Assessor/Internal Verifier**, **Operation Engineer**, **Operation Supervisor**, **Operation Section Head**, **Production Supervisor**, **Senior Operator** and **Senior Instructor/Trainer** from various international companies such as the AIFurat Petroleum Company (AFPC), ADCO, Basrah Gas Company-Iraq, North Rumaila NGL Plant, Anton Oilfield Services and Majnoon Oil Field-Iraq, just to name a few.

Mr. Jamal has a **Bachelor's** degree in **Petroleum Engineering**. Further, he is a **Certified Training of Trainer (ToT)**, an **Authorized H₂S Trainer**, a **Certified OPITO Competency Assessor**, an **Authorized Assessor/Verifier** in **Oil & Gas Operation**, a **Certified Instructor/Trainer** and has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Howard 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	Type of Furnaces & Major Parts
0930 – 0945	Break
0945 – 1100	Performance Monitoring & Optimization Flame Impingement • Skin Temp
1100 – 1230	Performance Monitoring & Optimization (cont'd) Tube Life
1230 – 1245	Break
1245 – 1430	Performance Monitoring & Optimization (cont'd) Air Requirement
1430	Lunch & End of Day One

Day 2

0730 – 0930	Performance Monitoring & Optimization (cont'd) Heating Value
0930 – 0945	Break
0945 – 1100	Performance Monitoring & Optimization (cont'd) Draft
1100 – 1230	Performance Monitoring & Optimization (cont'd) Thermal Efficiency
1230 – 1245	Break
1245 – 1430	Burners F/G, F/O, Major Parts
1430	Lunch & End of Day Two

Day 3

0730 – 0900	Combustion, NOx Control
0900 – 0915	Break
0915 – 1100	Fuel Specifications, Gas & Liquid
1100 – 1230	Furnace Initial Startup After Construction
1230 – 1245	Break
1245 – 1430	Furnace Normal Startup After Shutdown
1430	Lunch & End of Day Three

Day 4

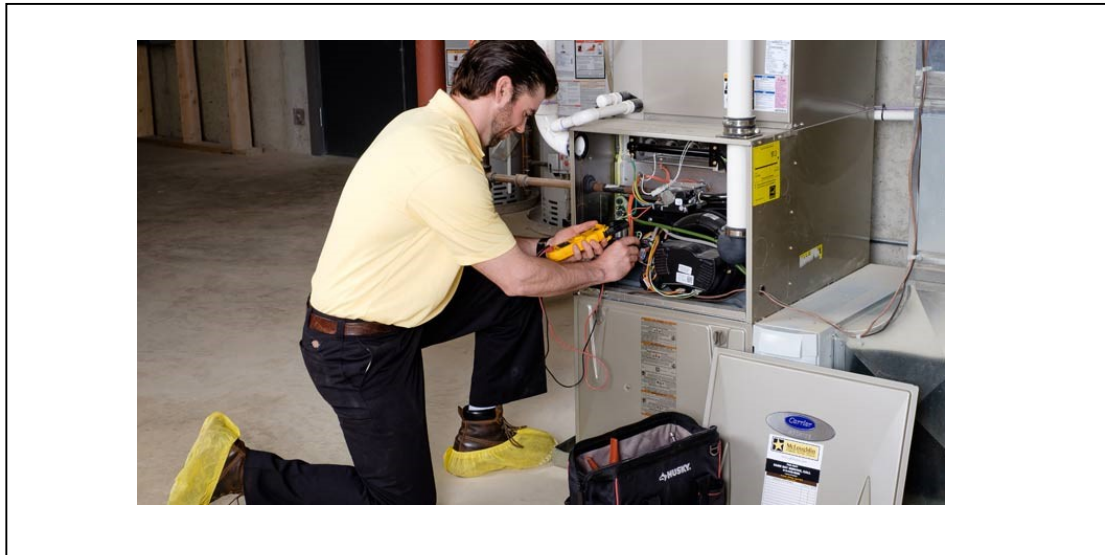
0730 – 0900	Furnace Explosion & Implosion
0900 – 0915	Break
0915 – 1100	Furnace Decoking Procedure
1100 – 1230	Operation & Troubleshooting Draft: Reduced Draft, Excessive Draft, Optimizing Draft, Air Leaks
1230 – 1245	Break
1245 – 1430	Operation & Troubleshooting (cont'd) Combustion: Air Supply, Insufficient Air, Optimizing Excess Air
1430	Lunch & End of Day Four

Day 5

0730 – 0900	Operation & Troubleshooting (cont'd) Flue Gas: Oxygen Content, Flame Appearance, Fin Tube Damage
0900 – 0915	Break
0915 – 1100	Operation & Troubleshooting (cont'd) Convection & Radiation Saving Energy
1100 – 1230	Operation & Troubleshooting (cont'd) Hot Tubes: Spotting a Hot Tube, Coke Deposition, Cooling an Overheated Tube
1230 – 1245	Break
1245 – 1400	Heater Accidents, Safety Concerns & Case Studies
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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