

COURSE OVERVIEW PE0912

Advanced Refinery Operations, Plants Process & Troubleshooting

Course Title

Advanced Refinery Operations, Plants Process & Troubleshooting

Course Date/Venue

October 12-16, 2025/Jawhara Meeting Room, The H Hotel, Sheikh Zayed Road Trade Centre, Dubai, UAE

Course Reference

PE0912

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.



Refinery processes consist of many complex apparatuses involving both moving and static parts as well as interconnecting pipes, control mechanisms and electronics, mechanical and thermal stages, heat exchangers, waste and side product processing units, power ducts and many others. Bringing such a complicated unit online and ensuring its continued productivity requires substantial skill at anticipating, detecting and solving acute problems. Failure to identify and resolve these problems quickly can lead to lost production, off-spec product, equipment loss, and even catastrophic accidents. Therefore, the ability to troubleshoot refinery operations is one of the most valuable skills operations personnel can possess.



Typical refineries operate about 26 days of the month to cover costs. The remaining days in the month they operate to make a profit. If the process is down for five days, then the company cannot cover costs and no profit has been made. Engineers must quickly and successfully solve any troublesome problems that occur. Sometimes the problems occur during startup; sometimes, just after a maintenance turn-around; and sometimes unexpectedly during usual operation. A troubleshooting problem is one where something occurs that is unexpected to such an extent that it is perceived that some corrective action may be needed. The trouble usually occurs somewhere in a system that consists of various pieces of interacting equipment run by people.

Troubleshooting is the process used to diagnose the fault safely and efficiently, decide on corrective action and prevent the fault from reoccurring. Process engineering, especially troubleshooting, is different from most other branches of technology in another respect: It is not advancing very quickly. The principles of distillation, hydraulics, phase separation, and heat transfer, as they apply to process applications, have been well known for quite some time. The challenge in troubleshooting consists of untangling the influence that human error, mechanical failure, and corrosion have on these well-known principles. The aspect of the job that makes it so difficult is that most refinery problems are initiated by human error – a never-ending source of surprise.

Most Refinery troubles have a simple origin. However, this simple origin is clouded by false data, misconceptions, superficial observations, and third-hand reports. The error that most engineers often make is that they develop a theory, usually with process computer simulations, as to the cause of the malfunction. The theory is then reviewed with management and other technical personnel at a large meeting. If no one objects to the theory, it is accepted as the solution to the problem. Technical training is one tool that should be taken into the field to reveal the underlying problem, but confining the investigation to technical areas only will severely limit the chances of success.

Course Objectives

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

- Apply and gain an in-depth knowledge on advanced refinery operations, plants process and troubleshooting
- Discuss petroleum refinery process including crude processing, desalting, atmospheric distillation and vacuum distillation
- Explain heavy oils processing and bottom of the barrel upgrading covering the coking and thermal processes, delayed coking, fluid coking, flexicoking and visbreaking
- Carryout process of production that covers the fluid catalytic cracking, hydrocracking, cat cracking, isomerization, alkylation, hydrotreating and catalytic reforming
- Review process operations key operational conditions and factors as well as discuss blending for product specifications, hydrogen production, refinery gas plants and acid gas treating
- Identify process troubleshooting including troubleshooting concepts and techniques, troubleshooting tools, typical problems, flooding and its detection
- Determine refinery economics comprising of residue reduction, asphalt and residual fuel, refinery complexity and netback

Exclusive Smart Training Kit - H-STK®



*Participants of this course will receive the exclusive “Howard 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 basic overview of all significant aspects and considerations of advanced refinery operations plants process and troubleshooting for process engineers, process technical staff, plant managers, team leaders, section heads, production managers, production engineers, operations managers, operations engineers, refinery managers, engineers, superintendents, supervisors, shift superintendents and foremen, plant supervisors, operators, lead operators, area superintendents and technical staff to improve their knowledge on refinery process unit operation and equipments used in operation and handling of process and equipments during any problem and emergency.

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® (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 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. Mohammed Hamami, is a **Senior Process Engineer** with an extensive practical experience within the **Oil, Gas, Refinery, Petrochemical** and **Power** industries. His experience covers **Petroleum Refinery Process, Refinery Operational Economics & Profitability, Aromatics Manufacturing Process, Process Plant Troubleshooting & Engineering Problem Solving, Process Equipment Operation, Process Plant Operation, Process Plant**

Start-up & Commissioning, Process Plant Optimization, Oil & Gas Field Operation, Oil Movement, Storage & Troubleshooting, LPG Oil & Gas Operation & Troubleshooting, Clean Fuel Specification, Petroleum Refinery Process, Process Reactor Operation & Troubleshooting, Emission Regulation, Hydrogen Production Operation, Steam Reforming Technology, Clean Fuel Technology & Standards, Crude Oil Production, Desulphurization, Synthesis Gas Production, Naphtha Isomerization, Diesel Fuel Additives, Storage Tanks Filtration, Fuel Quality Inspection, Crude Oil & LNG Storage, LNG & LPG Plants Gas Processing, Refinery Process Operations Technology, Liquid Bulk Cargo Handling, Gas Conditioning & Processing Technology, Distillation Column Design & Operation and Gasoline & Diesel Fuel Technology. Further he is also well-versed in **Gas Treating, Hydro-treating & Hydro-Cracking, Catalyst Material Handling, Gas Sweetening & Sulfur Recovery, Hydro Carbon Dew Point (HCDP) Control, Heat Exchangers & Fired Heaters, Amine Gas Sweetening, Plastic Additives Selection & Application, Crude & Vacuum Process Technology, Flare & Pressure Relief Systems, Stock Management & Tank Dipping Calculation, NGL Recovery & Fractionation, Refrigerant & NGL Extraction and Catalytic Cracking & Reforming.**

During his long professional career, Mr. Nassar worked as a **Refinery Manager, Operations Manager, Section Head/Superintendent** and **Process Engineer** for **Process Units, Utilities & Oil Movement** in various companies. He has been responsible for a number of **technological-driven world-scale hydrocarbon processing projects** from **beginning to successful start-up.**

Mr. Nassar has a **Bachelor** degree in **Chemical Engineering**. He is an **active member** of the **American Institute of Chemical Engineers (AIChE)** and has presented **technical papers** at its **several national meetings**. He has largely participated in the **start-up of seven world-scale process plants** which made him an **International Expert** in **Process Plant Start-Up** and **Oil Movement** and a **Certified Instructor/Trainer.**

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: Sunday, 12th of October 2025

0730 – 0745	Registration & Coffee
0745 – 0800	Welcome & Introduction
0800 – 0815	PRE-TEST
0815 – 0800	Petroleum Refinery Process
0800 – 0930	Crude Processing
0930 – 0945	Break
0945 – 1100	Desalting
1100 – 1130	Atmospheric Distillation
1130 – 1215	Vacuum Distillation
1215 – 1230	Heavy Oils Processing/Bottom of the Barrel Upgrading (Coking & Thermal Processes, Delayed Coking, Fluid Coking, Flexicoking, Visbreaking)
1230 – 1245	Break
1245 – 1315	Process of Production
1315 – 1420	Case Study – Example
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Monday, 13th of October 2025

0730 – 0830	Fluid Catalytic Cracking
0830 – 0930	Hydrocracking
0930 – 0945	Break
0945 – 1100	Cat Cracking
1100 – 1130	Isomerization
1130 – 1200	Alkylation
1200 – 1230	Hydrotreating
1230 – 1330	Break
1330 – 1400	Catalytic Reforming
1400 – 1420	Case Study – Example
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Tuesday, 14th of October 2025

0730 – 0830	Process Key Operational Conditions & Factors
0830 – 0930	Blending for Product Specifications
0930 – 0945	Break
0945 – 1100	Hydrogen Production
1100 – 1130	Refinery Gas Plants
1130 – 1200	Acid Gas Treating
1200 – 1230	Utilities
1230 – 1330	Break
1330 – 1400	Sulfur Recovery Plants
1400 – 1420	Case Study – Example
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4: Wednesday, 15th of October 2025

0730 – 0830	<i>Utilities</i>
0830 – 0930	<i>Oil & Gas Measurement & Control</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Process Troubleshooting Concepts & Techniques</i>
1100 – 1130	<i>Troubleshooting Tools</i>
1130 – 1200	<i>Typical Problems</i>
1200 – 1230	<i>Flooding & its Detection</i>
1230 – 1330	<i>Break</i>
1330 – 1400	<i>Interaction of Process & Equipment</i>
1400 – 1420	<i>Case Study – Example</i>
1420 – 1430	<i>Recap</i>
1430	<i>Lunch & End of Day Four</i>

Day 5: Thursday, 16th of October 2025

0730 – 0830	<i>Saltation & Entrapment</i>
0830 – 0930	<i>Tower Scan & Inspection</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Refinery Economics</i>
1100 – 1130	<i>Residue Reduction</i>
1130 – 1145	<i>Asphalt & Residual Fuel</i>
1145 – 1215	<i>Refinery Complexity & Netback</i>
1215 – 1230	<i>Economic Evaluation</i>
1230 – 1245	<i>Break</i>
1245 – 1315	<i>Cost Estimation</i>
1315 – 1345	<i>Case Study – Example</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

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org