



COURSE OVERVIEW PE0900 Refinery Units (Operations & Engineering) - Basics

Course Title

Refinery Units (Operations & Engineering) - Basics

Course Date/Venue

Session 1: February 17-21, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: August 03-07, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha

Course Reference

PE0900

Course Duration/Credits

Five days/3.0 CEUs/30PDHs

Course Description

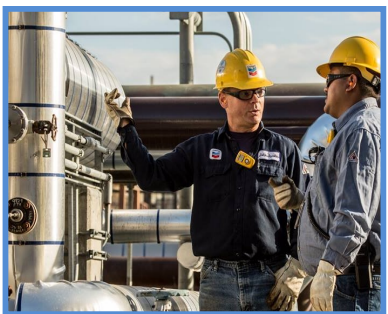


This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

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.

This course is designed to provide instruction in the different types of troubleshooting techniques, procedures, and methods used to solve refinery problems. Participants will use existing knowledge of equipment, systems, and instrumentation to understand the troubleshooting process operations of an entire unit in a refinery. Participants study concepts related to troubleshooting commissioning, normal startup, normal operations, normal shutdown, turnarounds, and abnormal situations, as well as the process team role in performing tasks associated with these concepts within an operating unit in the refinery.

Course Objectives

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

- Processes in Refinery
- Equipments used in different processes and troubleshooting refinery operations such as crude distillation, delayed coking cycles & process, amine regeneration and scrubbing, sulfur recovery, alkylation, fluid catalytic cracking units, FCCU product fractionation
- Chemicals used in different processes
- Troubleshooting process equipments used in refinery such as the refrigeration systems, centrifugal pumps, distillation towers, distillation and vacuum towers, treating liquid hydrocarbons, process heaters, water coolers, alarms and trips
- Practical problems and emergencies concerning refinery operations
- Troubleshooting Gas drying & compression
- Rules of Thumb for Process Engineers
- Better understanding of operation parameters, their effects on quality, economy and safety.

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

The course of Refinery Process Technology & Troubleshooting is required 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 & 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

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 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. Mohammad Hamami, is a **Senior Process Engineer** with an extensive practical experience within the **Oil, Gas, Refinery, Petrochemical and Power** industries. His experience covers **Clean Fuel Technology & Standards, Clean Fuel Specification, Emission Regulation, Crude Oil Production, Desulphurization, Synthesis Gas Production, Naphtha Isomerization, Diesel Fuel Additives, Storage Tanks Filtration, Fuel Quality Inspection, 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, Petroleum Refinery Process, Process Reactor Operation & Troubleshooting, LPG Oil & Gas Operation & Troubleshooting, 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 **Refinery Operational Economics & Profitability, Aromatics Manufacturing Process, Hydrogen Production Operation, Steam Reforming Technology, 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. Mohammad 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. Mohammad has a **Bachelor's 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

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Refinery Process
0930 – 0945	Break





0945 – 1100	Different Refinery Process Technologies <i>Parameters to be Monitored & Controlled in Different Processes & Their Use in Maintaining Product Specification</i>
1100 – 1230	Chemicals Used in Different Refinery Processes <i>Type & Nature of Chemicals Used</i>
1230 – 1245	Break
1245 – 1420	Chemicals Used in Different Refinery Processes (cont'd) <i>Optimization of Usage • Safe Storage of the Chemicals</i>
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0930	Different Types of Crude Oil
0930 – 0945	Break
0945 – 1100	Petroleum Products and Specification <i>Different Types of Storage Tanks for Storage of Petroleum Products</i>
1100 – 1230	Petroleum Chemistry <i>Basic of Chemical Reaction</i>
1230 – 1245	Break
1245 – 1420	Petroleum Chemistry (cont'd) <i>Presence of Impurities in Crude Oil & Their Products & Their Effects - Troubleshoot</i>
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0930	Brief Description of Equipments Used in Different Processes
0930 – 0945	Break
0945 – 1100	Instruments <i>Types of Instruments Used to Measure/Indicate Flow, Level, Temperature, Pressure & Impurities • Necessity of Collection & Preservation of Process & Operation Data</i>
1100 – 1230	Troubleshooting Refinery Operations <i>Crude Distillation • Delayed Coking Cycles • Delayed Coking Process • Amine Regeneration and Scrubbing • Sulfur Recovery</i>
1230 – 1245	Break
1245 – 1420	Troubleshooting Refinery Operations (cont'd) <i>Alkylation • Fluid Catalytic Cracking Units • FCCU Product Fractionation • Saving Energy at Reduced Feed Rates</i>
1420 – 1430	Recap <i>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</i>
1430	Lunch & End of Day Three

Day 4

0730 – 0930	Troubleshooting Process Equipment in the Refinery <i>Refrigeration Systems • Centrifugal Pumps • Distillation Towers • Vacuum Towers</i>
0930 – 0945	Break
0945 – 1100	Troubleshooting Process Equipment in the Refinery (cont'd) <i>Treating Liquid Hydrocarbons • Process Heaters • Water Coolers • Alarms & Trips</i>



1100 – 1230	Practical Problems Additional Distillation Problems • Fouled Trays • Dehydrating Light-Ends Towers • Handling of Different Probable Emergencies
1230 – 1245	Break
1245 – 1420	Practical Problems (cont'd) Vapor-Liquid Separation • Refinery Metallurgy for Novices • Unusual Noises & Vibrations
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 Four

Day 5

0730 – 0930	Troubleshooting Gas Drying & Compression Gas Drying
0930 – 0945	Break
0945 – 1100	Troubleshooting Gas Drying & Compression (cont'd) Gas Compression
1100 – 1230	Rules of Thumb for Process Engineers Suggestions for New Process Operating Engineers • Planning a Performance Test • Understanding Control Board Instruments • Importance & Use of Instrumentation in Process Technology
1230 – 1245	Break
1245 – 1345	Rules of Thumb for Process Engineers How to Make Field Measurements • Unit of Measurement Used in Petroleum Technology & Conversion Factors • The People Problem • Effect of Operation Parameters on Quality, Economy & Safety
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

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