



COURSE OVERVIEW PE0640 Troubleshooting Process Operations

Course Title

Troubleshooting Process Operations

Course Date/Venue

Please see page 3

Course Reference

PE0640

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.

Production 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 process operations is one of the most valuable skills operations personnel can possess.



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 process problems are initiated by human error – a never-ending source of surprise.

This course is designed to provide instruction in the different types of troubleshooting techniques, procedures, and methods used to solve process problems. Participants will use existing knowledge of equipment, systems, and instrumentation to understand the troubleshooting process operations of an entire unit in a facility. 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.

Course Objectives

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

- Apply systematic techniques in troubleshooting process operations and carryout successful troubleshooting activities
- Follow a structured technique for problem solving and troubleshooting process operation, using the guide-words: engage – define – explore – plan – do – check
- Analyze the mental problem-solving process and demonstrate the use of the troubleshooter's worksheet
- Practice the rules-of-thumb techniques for trouble-shooting process equipment and enumerate the typical causes of problems with process equipment that covers an extensive range of process equipment
- Develop problem solving, data gathering & interpersonal skills and recognize the importance of these skills in troubleshooting process operations
- Practice the trouble-shooting skills by working in small workshops on a wide range of case studies drawn from the process industries

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 covers systematic techniques in troubleshooting process operations and carrying out successful troubleshooting activities. Process engineers, maintenance engineers, maintenance staff, plant engineers, team leaders, section heads, production engineers, operations engineers and field engineers will definitely benefit from the engineering problem solving approach of the course. Shift foremen, plant supervisors and other technical staff will gain an excellent knowledge from the practical aspects of this course.

Pre-Requirement: Participants must have a good understanding on the chemical engineering basic principles of operations and process equipment.



Course Date/Venue

Session(s)	Date	Venue
1	April 05-09, 2026	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, Kingdom of Saudi Arabia
2	May 17-21, 2026	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
3	July 19-23, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	September 14-18, 2026	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
5	October 04-08, 2026	Pierre Lotti Meeting Room, Movenpick Hotel Istanbul Golden Horn, Istanbul, Turkey
6	November 01-05, 2026	Meeting Plus 9, City Centre Rotana, Doha, Qatar
7	January 04-08, 2027	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain
8	January 31-February 04, 2027	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
9	March 15-19, 2027	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom

Course Fee

Doha	US\$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	US\$ 6,000 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	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.
Al Khobar	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.
London	US\$ 8,800 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Seville	US\$ 8,800 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Cairo	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.

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: -

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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**. 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.

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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.

Accommodation

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





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. John Petrus PhD, MSc, BSc, is a **Senior Petroleum & Process Engineer** with over **30 years** of **onshore & offshore** experience within the **Oil & Gas, Refinery** and **Petroleum** industries. His wide experience covers in the areas of **Advanced Operational & Troubleshooting Skills, Advanced Operator Responsibilities, (CRU) Advanced Operation, Oil Field Operations, Oil & Gas Operations & Troubleshooting, Operations & Maintenance** for Typical Gas Processing Plant, **Pressure Vessel Operation, Operations Abnormalities & Plant Upset, Principles of Operations Planning, Asset Operational Integrity** for Operations – Intermediate, **Plant & Equipment Integrity, Gas Processing, Gas & Condensate Analysis, Gas Sweetening Process** at Upstream Oil & Gas, **De-Sulfurization Technology, Gasoline Blending** for Refineries, **Chemical Engineering, Process Troubleshooting, Distillation Towers, Fundamentals of Distillation** for Engineers, **Distillation Operation and Troubleshooting, Advanced Distillation Troubleshooting, Distillation Technology, Vacuum Distillation, Distillation Column Operation & Control, Oil Movement Storage & Troubleshooting, Process Equipment Design, Applied Process Engineering Elements, Process Plant Optimization, Revamping & Debottlenecking, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Monitoring, Catalyst Selection & Production Optimization, Process Plant Start-up & Commissioning, Clean Fuel Technology & Standards, Flare, Blowdown & Pressure Relief Systems, Oil & Gas Field Commissioning Techniques, Process Reactors Start-Up & Shutdown, Urea Manufacturing Process Technology, Continuous Catalytic Reformer (CCR), Rotating Equipment Maintenance & Troubleshooting.** Further he is also well versed in **Drill String Design & Drilling Optimization, Drill String Design Calculations, Formation Damage & Acid Stimulation, Production Technology & Engineering, Horizontal & Multilateral Wells, Well Completions, Well Logs, Well Stimulation & Production Logging, Well Completion Design & Operation, Well Surveillance, Well Testing, Well Stimulation & Control and Workover Planning, Completions & Workover, Hole Cleaning & Logging, Servicing and Work-Over Operations, Wellhead Operations, Maintenance & Testing, Petrophysics/Interpretation of Well Composite, Reservoir & Tubing Performance, Practical Reservoir Engineering, Clastic Exploration & Reservoir Sedimentology, Carbonate Reservoir Characterization & Modeling, Seismic Interpretation, Mapping & Reservoir Modelling, Reservoir Geology, Integrating Geoscience into Carbonate Reservoir Management, Faulted & Fractured Reservoirs, Fractured Hydrocarbon Reservoirs, Analyses, Characterisation & Modelling of Fractured Reservoirs & Prospects, Fracture Reservoir Modeling Using Petrel, Reservoir Engineering Applied Research, Artificial Lift, Artificial Lift System Selection & Design, Electrical Submersible Pumps (ESP), Enhance Oil Recovery (EOR), Oil In Place (OIP) Estimation & Range of Uncertainty, Hydraulic Fracturing, Sand Control Techniques, Perforating Methods & Design, Perforating Operations, Petroleum Exploration & Production, Hydrocarbon Exploration & Production, Exploration & Production, Play Assessment & Prospect Evaluation, Formation Evaluation, Petroleum Engineering Practices, Petroleum Hydrogeology & Hydrodynamics, Project Uncertainty, Decision Analysis & Risk Management, Decision Analysis & Uncertainty Management, Exploration & Development Geology, Sedimentology & Sequence Stratigraphy, Structural Interpretation in Exploration & Development, Petrel Geology, Geomodeling, Structural Geology, Applied Structural Geology in Hydrocarbon Exploration, Petrophysics and Geology of the Oil & Gas Field.. Further, he is also well-versed in **seismic interpretation, mapping & reservoir modelling tools** like **Petrel** software, **LandMark, Seisworks, Geoframe, Zmap** and has extensive knowledge in **MSDos, Unix, AutoCAD, MAP, Overlay, Quicksurf, 3DStudio, Esri ArcGIS, Visual Lisp, Fortran-77 and Clipper.** Moreover, he is a world **expert** in **analysis and modelling of fractured prospects and reservoirs** and a **specialist and developer of fracture modelling software tools** such as **FPDM, FMX and DMX** Protocols.**

During his career life, Dr. Petrus held significant positions and dedication as the **Executive Director, Senior Geoscience Advisor, Exploration Manager, Project Manager, Manager, Process Engineer, Mechanical Engineer, Maintenance Engineer, Chief Geologist, Chief of Exploration, Chief of Geoscience, Senior Geosciences Engineer, Senior Explorationist, Senior Geologist, Geologist, Senior Geoscientist, Geomodeller, Geoscientist, CPR Editor, Resources Auditor, Project Leader, Technical Leader, Team Leader, Scientific Researcher and Senior Instructor/Trainer** from various international companies and universities such as the **Dragon Oil Holding Plc., ENOC, MENA, ENI Group of Companies, Ocre Geoscience Services (OGS), Burren RPL, Ministry of Oil-Iraq, Eni Corporate University, Stanford University, European Universities, European Research Institutes, NorskHydro Oil Company, Oil E&P Companies,** just to name a few.

Dr. Petrus has a **PhD in Geology and Tectonophysics** and **Master and Bachelor** degrees in **Earth Sciences** from the **Utrecht University, The Netherlands.** Further, he is a **Certified Instructor/Trainer, a Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management (ILM),** a Secretary and Treasurer of Board of Directors of Multicultural Centre, Association Steunfonds SSH/SSR and Founding Member of Sfera Association. He has further published several scientific publications, journals, research papers and books and delivered numerous trainings, workshops, courses, seminars and conferences 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

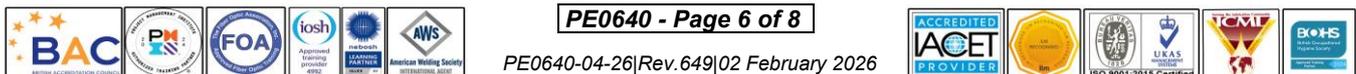
The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	What is Troubleshooting? Characteristics of a Trouble-Shooting Problem • Characteristics of the Process Used to Solve Trouble-Shooting Problems
0930 – 0945	Break
0945 – 1100	Self-Assessment & Case Studies
1100 – 1230	The Mental Problem-Solving Process Problem Solving • Troubleshooting • Overall Summary of Major Skills & a Worksheet • Example Use of the Trouble-Shooter’s Worksheet
1230 – 1245	Break
1245 – 1420	Video
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0930	Rules of Thumb for Troubleshooting Overall • Transportation Problems • Energy Exchange • Homogenous Separation • Heterogenous Separations • Reactor Problems • Mixing Problems • Size-Decrease Problems • Size Enlargement • Vessels, Bins, Hoppers & Storage Tanks • “Systems” Thinking • Health, Fire & Stability
0930 – 0945	Break
0945 – 1100	Case Study Observation
1100 – 1230	Problem Solving Skills Developing Awareness of the Problem-Solving Process • Strategies • Exploring the “Context”: What is the Real Problem?
1230 – 1245	Break
1245 – 1420	Video
1420 – 1430	Recap
1430	Lunch & End of Day Two





Day 3

0730 – 0930	Problem Solving Skills (cont'd) <i>Creativity • Self-Assessment</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Data Gathering Skills <i>How to Select Valid Diagnostic Actions • Consistency: Definitions, Cause-Effect & Fundamentals • Classification • Recognizing Patterns • Reasoning</i>
1100 – 1230	Interpersonal Skills <i>Interpersonal Skills • Factors that Affect Personal Performance • The Environment</i>
1230 – 1245	<i>Break</i>
1245 – 1420	Video
1420 – 1430	Recap
1430	<i>Lunch & End of Day Three</i>

Day 4

0730 – 0930	Case Studies - Working in Groups <i>Case Study chosen from a list by the class</i>
0930 – 0945	<i>Break</i>
0945 – 1145	Case Studies - Working in Groups (cont'd) <i>Case Study Chosen from a List by the Class (cont'd)</i>
1145 – 1230	Case Studies - Working in Groups (cont'd) <i>Case Study Chosen from a List by the Class (cont'd)</i>
1230 – 1245	<i>Break</i>
1245 – 1420	Video
1420 – 1430	Recap
1430	<i>Lunch & End of Day Four</i>

Day 5

0730 – 0930	Case Studies - Working in Groups (cont'd) <i>Case Study Chosen from a List by the Class (cont'd)</i>
0930 – 0945	<i>Break</i>
0945 – 1145	Case Studies - Working in Groups (cont'd) <i>Case Study Chosen from a List by the Class (cont'd)</i>
1145 – 1230	Case Studies - Working in Groups (cont'd) <i>Case Study Chosen from a List by the Class (cont'd)</i>
1230 – 1245	<i>Break</i>
1245 – 1345	Case Studies - Working in Groups (cont'd) <i>Case Study Chosen from a List by the Class (cont'd)</i>
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
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:-



- The Case of the Cycling Column
- The Sulfuric Acid Pump Problem
- The Case of the Reluctant Crystallizer
- The Lousy Control System
- The Case of the Flashy Flare
- The Drooping Temperatures
- The Case of the Platformer Fires
- The Case of the Utility Dryer
- The Lazy Twin
- The Case of the Dirty Vacuum Gas Oil
- The Case of the Delinquent Exchangers
- The Boiler Feed Heater

Course Coordinator

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