COURSE OVERVIEW PE0640
Troubleshooting Process Operations

Course Title
Troubleshooting Process Operations

Course Date/Venue
September 28-October 02, 2025/TBA Meeting Room, Mövenpick Hotel Istanbul Golden Horn, Istanbul, Turkey

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

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:

Dr. Emad Al-Hasany, PhD is a **Senior Process & Petroleum Engineer** with **Offshore & Onshore** experience within the **Oil & Gas**, **Refinery** and **Petrochemical** industries. His wide expertise covers in the areas of **Process Plant Commissioning**, **Cost Estimation**, **Process Plant Start-Up Management**, **Clean Fuel** Technology & Standards, **Heat Exchangers & Fired Heaters** Operation & Troubleshooting, **Heat Medium Fired Heater** Troubleshooting & Maintenance, **Process Reactor** Operation & Troubleshooting, **Process Equipment** Design, Sizing, Selection, Applications & Troubleshooting, **Process Engineering Calculations**, **Gas Processing Plant** Operations & Control, **Gas Processing** Monitoring & Troubleshooting, **Process Plant** Optimization & Energy Conservation, **Hydro-Treating** Technology, **Oil & Gas** Field Operations, **Oil Movement**, Storage & Troubleshooting, **Start-Up & Shutdown**, **Gas/Oil Separates**, **Surge Vessels**, **Sludge Catcher**, **Knockout LP & HP Flare System**, **Close & Open Drain System**, **Skimmer Pit Evaporation Pit System**, **Filters**, **Driers**, **Pumps**, **Turbines**, **Compressors**, **York Refrigeration Compressors**, **Heaters & Combustion Gases Fire**, **Emergency Diesel Generators**, **Electrical & Diesel Fire Water Pumps**, **Gas & Fire Detectors**, **Pig Launcher**, **Purging Pipelines**, **Pressurized Vessels**, **Heat Exchangers**, **Atmospheric**, **Flash**, **Vacuum**, **Azeotrpic**, **Weiss Fractional Distillation**, **Oil & Gas Treatment**, **Separators**, **Filtration**, **Dehydration (Glycol & Molecular Sieves System)**, **Fire Tube Heaters**, **Combustion Gas**, **Temperature Level**, **Control Valves**, **Solenoid Valves**, **Cascade Control**, **Switches**, **Transmitter**, **Transducer**, **RTD Sensitivity**, **Orifice Plat**, **I/P Converter**, **Rot Meter**, **Floating**, **Displacer**, **DP Cells**, **PIDs**, **Flare Blowdown & Pressure Relief Systems**, **Pumps**, **Compressors**, **Turbines** & Troubleshooting, **Centrifugal Compressor & Steam Turbine**, **Valves**, **Safety Relief Valve Sizing**, Selection, Operation, Inspection, Maintenance & Troubleshooting, **Tank & Tank Farms**, **Hydraulic Pump**, **Well Engineering**, **Acidation**, **Wellheads** Preparing & Maintenance, **Well Operations & Surveys**, **Well Stimulation**, **Logging** and **Reservoir Engineering**. Further, he is also well-versed in **HYSYS**, **PRO II**, **OLGA**, **PIPESIM, PETREL**, **Artificial Lift**, **First Aid & Firefighting**, **Environment Protection**, **NORM Awareness**, **SHOC** (**Safe Handling of Chemicals**), **Permit to Work** (**PTW**), **HSE** Auditing & Reporting, **Emergency Response**, **Defensive Driving**, **H2S**, **Accident/Incident Investigation**, **Process Safety Management**, **Root Cause Analysis**, **OSHA** General Industry, **Water Injection**, **Water Treatment**, **HAZOP**, **Risk Assessment**, **Gas Chromatography**, **Corrosion** and **Cathodic Protection**.

During his career life, Dr. Emad has gained his practical and field experience through his various significant positions and dedication as the **Production Main Station Manager**, **Manager**, **Production Superintendent**, **Production Supervisor**, **Production Engineer**, **HAZOP Consultant**, **Instructor** and **Lecturer** for various companies and universities such as the AL-Euphrates University, Dero Oilfields, Syrian Petroleum Company (SPC), Kokab Co. and Alharratah Oilfield.

Dr. Emad has a **PhD** in **Reservoir Management**, a **Master** degree in **Production Engineering** and a **Bachelor** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer** and has further delivered numerous training, 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$ 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.

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: ***Sunday, 28th of September 2025***

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: ***Monday, 29th of September 2025***

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: ***Tuesday, 30th of September 2025***

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

Day 4: ***Wednesday, 01st of October 2025***

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

Day 5: ***Thursday, 02nd of October 2025***

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

- 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

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