



COURSE OVERVIEW PE0640-4D Troubleshooting Process Operations

Course Title

Troubleshooting Process Operations

Course Date/Venue

December 16-19, 2024/ Club B Meeting Room, Ramada Plaza by Wyndham Istanbul City Center, Istanbul, Turkey

Course Reference

PE0640-4D



Course Duration/Credits

Four days/2.4 CEUs/24 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

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 Fee

US\$ 5,000 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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


Certificates are accredited by the following international accreditation organizations: -

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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 **2.4 CEUs** (Continuing Education Units) or **24 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.

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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.

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



Mr. Pete Du Plessis, MSc, BSc, is a **Senior Process & Safety Engineer** within the **Oil, Gas** and **Petrochemical** industries. His expertise widely covers in the areas of **Process Plant** Troubleshooting, Engineering Problem Solving, **Process Plant Optimization** Technology & Continuous Improvement, **Refinery Operational** Planning & Profitability, **Process Plant** Rehabilitation, **Revamping & Debottlenecking**, **Chemical Plants** Troubleshooting, **Flare Relief** Systems, **Risk Assessment** within Production Operation, **Hazard** Identification, **Safety Auditing**, **Site Inspection**, Quantified Risk Assessment (**QRA**), Process Hazard Analysis (**PHA**), Process Safety Management (**PSM**), **HAZOP** Studies & Leadership, **FMEA**, **Waste** Management, Industrial Effluents, **Chemical Handling**, **Emergency Response** Services, **HAZCOM**, **HAZWOPER** and **HAZMAT** with over **30** years of practical experience in the **process** industry. His wide experience also includes **Environmental Management (ISO 14001)**, **Safety Management (OHSAS 18001)**, **Quality Management (ISO 9001)**.

While Mr. Du Plessis has been very active in the process industry he has likewise headed Consultancy projects for major **petrochemical companies**. In all his projects, he utilizes a systems approach which includes **risk management**, **process safety**, health & environmental management, human behaviour and quality management. Furthermore, he has come to share his expertise through the **numerous international trainings** he has held on **PHA**, **HAZOP**, **Risk Assessment**, Handling **Hazardous Materials** & Chemicals, Petroleum Products Handling & Transportation. Moreover, he completed various assignments as a consultant, trainer, facilitator, auditor & designer and conducted numerous licensed international Safety, Technology and Auditing Awareness & Implementing training courses including **IMS**, **ISO 9001**, **ISO 14001**, **ISO 27001**, **ISO 17799**, **OHSAS 18001** audits & assessments. With his accomplishments and achievements, he had been a **Safety Superintendent**, **Senior Safety Official** and **Senior Process Controller** for several international petrochemical companies.

Mr. Plessis has **Bachelor** degree with **Honours** in **Industrial Engineering & Management**. Further, he has gained **Diploma** in **Quality & Production Management**. He is also a **Certified Assessor & Moderator** with the Manufacturing, Engineering & Related Services Education and Training Authority (MERSETA), a **Certified Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** and a **Certified Instructor/Trainer** by the APICS. He has further delivered numerous trainings, courses, seminars, conferences and workshops 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: Monday, 16th of December 2024

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: Tuesday, 17th of December 2024

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



	<i>"Context": What is the Real Problem?</i>
1230 - 1245	<i>Break</i>
1245 - 1420	Video
1420 - 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3: Wednesday, 18th of December 2024

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: Thursday, 19th of December 2024

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 - 1345	Video
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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