

COURSE OVERVIEW PE0429
Process Upsets, Troubleshooting and Optimisation

Course Title

Process Upsets, Troubleshooting and Optimisation

Course Date/Venue

July 28-August 01, 2024/Horus Meeting Room, Holiday Inn & Suites Maadi, Cairo, Egypt

Course Reference

PE0429

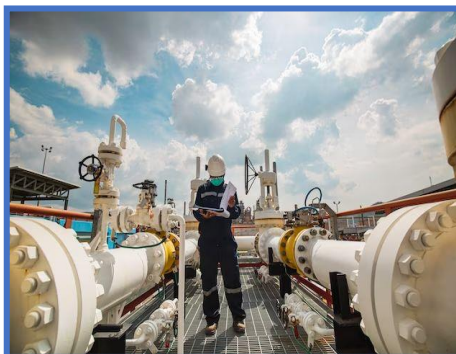
Course Duration/Credits

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.



This course is designed to provide participants with a detailed and up-to-date overview of Process Upsets, Troubleshooting and Optimisation. It covers the types, common causes and examples of process upsets in various industries; the impact of process upsets covering safety implications, environmental impact and economic consequences; the systematic approach to problem-solving, effective data collection and data analysis; identifying the common issues with pumps, compressors and heat exchangers; the diagnostic techniques and tools, control loops and instrumentation; and diagnosing control system issues.



Further, the course will also discuss the common issues in chemical reactions and separation processes; diagnosing chemical process issues; the root cause analysis (RCA) and fault tree analysis (FTA); the impact of human error on process upsets and various strategies to mitigate human error; the process optimization, cost-benefit analysis, economic optimization and techniques for optimizing energy use in processes; and the Six Sigma methodology, Lean principles and their application to process optimization.

During this interactive course, participants will learn the statistical process control (SPC), design of experiments (DOE) and optimization of chemical reactions; the heat integration, energy recovery and reuse, process intensification and sustainability in process optimization; developing an integrated troubleshooting and optimization plan; identifying and managing risks and developing contingency plans for process upsets; the strategies for successful implementation, monitoring and measuring improvements and the tools and techniques for maintaining process gains; the importance of teamwork in troubleshooting and optimization; and effective communication strategies.

Course Objectives

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

- Apply and gain an in-depth knowledge on process upsets, troubleshooting and optimization
- Identify the types of process upsets including the common causes and examples of process upsets in various industries
- Discuss the impact of process upsets covering safety implications, environmental impact and economic consequences
- Carryout systematic approach to problem-solving, effective data collection and data analysis
- Identify the common issues with pumps, compressors and heat exchangers and the diagnostic techniques and tools
- Discuss control loops and instrumentation, diagnose control system issues and identify the common issues in chemical reactions and separation processes
- Diagnose chemical process issues and apply root cause analysis (RCA) and fault tree analysis (FTA)
- Discuss the impact of human error on process upsets and various strategies to mitigate human error
- Apply process optimization, cost-benefit analysis, economic optimization and techniques for optimizing energy use in processes
- Explain Six Sigma methodology and Lean principles and their application to process optimization
- Recognize statistical process control (SPC), design of experiments (DOE) and optimization of chemical reactions
- Apply heat integration, energy recovery and reuse, process intensification and sustainability in process optimization
- Develop an integrated troubleshooting and optimization plan, identify and manage risks and develop contingency plans for process upsets
- Employ strategies for successful implementation, monitor and measure improvements and identify the tools and techniques for maintaining process gains
- Discuss the importance of teamwork in troubleshooting and optimization and apply effective communication strategies

Who Should Attend


This course provides an overview of all significant aspects and considerations of process upsets, troubleshooting and optimization for managers, leaders, section heads, superintendents, supervisors, process engineers, production engineers, plant engineers and planning engineers.

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 **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.

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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.

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. Hesham Abdou, PhD, MSc, PgDip, BSc, is a Senior Process & Petroleum Engineer with 40 years of integrated experience within the Oil & Gas industries. His specialization widely covers in the areas of Artificial Lift System, Artificial Lift Methods, Petroleum Economics, Petroleum Refinery Processing, Refinery Material Balance Calculation, Refinery Gas Treating, Asset Operational Integrity, Drilling Operations, Drilling Rig, Bits & BHA, Mud Pumps, Mud logging Services, Wireline & LWD Sensors, Casing & Cementing Operation, Completion & Workover Operations, Petroleum Engineering, Production Optimization, Well Completion, Rig & Rigless Workover, Advanced PVT & EOS Characterization, PVT/Fluid Characterization/EOS, Advanced Phase Behaviour & EOS Fluid Characterization, PVT Properties of Reservoir Fluids, Directional Drilling Fundamentals, Application & Limitation, Horizontal & Multilateral Wells (Analysis & Design), Directional, Horizontal & Multilateral Drilling, Root Cause Analysis (RCA), Root Cause Failure Analysis (RCFA), Root Cause Analysis Study, Root Cause Analysis Techniques & Methodologies, Process Hazard Analysis (PHA), Crude Oil Testing & Water Analysis, Crude Oil & Water Sampling Procedures, Equipment Handling Procedures, Crude & Vacuum Process Technology, Gas Conditioning & Processing, Cooling Towers Operation & Troubleshooting, Sucker Rod Pumping, ESP & Gas Lift, PCP & Jet Pump, Pigging Operations, Electric Submersible Pumps (ESP), Progressive Cavity Pumps (PCP), Natural & Artificial Flow Well Completion, Well Testing Procedures & Evaluation, Well Performance, Coiled Tubing Technology, Oil Recovery Methods Enhancement, Well Integrity Management, Well Casing & Cementing, Acid Gas Removal, Heavy Oil Production & Treatment Techniques, Water Flooding, Water Lift Pumps Troubleshooting, Water System Design & Installation, Water Networks Design Procedures, Water Pumping Process, Pipelines, Pumps, Turbines, Heat Exchangers, Separators, Heaters, Compressors, Storage Tanks, Valves Selection, Compressors, Tank & Tank Farms Operations & Performance, Oil & Gas Transportation, Oil & Gas Production Strategies, Artificial Lift Methods, Piping & Pumping Operations, Oil & Water Source Wells Restoration, Pump Performance Monitoring, Rotor Bearing Modelling, Hydraulic Repairs & Cylinders, Root Cause Analysis, Vibration & Condition Monitoring, Piping Stress Analysis, Amine Gas Sweetening & Sulfur Recovery, Heat & Mass Transfer and Fluid Mechanics.

During his career life, Dr. Hesham held significant positions and dedication as the **General Manager, Petroleum Engineering Assistant General Manager, Workover Assistant General Manager, Workover Department Manager, Artificial Section Head, Oil & Gas Production Engineer** from Agiba Petroleum Company and **Engineering Consultant/Instructor** for various Oil & Gas companies as well as a **Senior Instructor/Lecturer** for **PhD, Master & BSc degree students** from various universities such as the Cairo University, Helwan University, British University in Egypt, Banha University.

Dr. Hesham has **PhD and Master** degrees as well as **Post Graduate Diploma in Mechanical Power Engineering** and a **Bachelor** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer** and a **Peer Reviewer**. Dr. Hesham is an active member of Egyptian Engineering Syndicate and the Society of Petroleum Engineering. Moreover, he has published technical papers and journals and has 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 Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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 workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 28th of July 2024

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Process Upsets & Troubleshooting
0930 – 0945	<i>Break</i>
0945 – 1030	Fundamentals of Process Upsets <i>Definition & Types of Process Upsets • Common Causes & Examples of Process Upsets in Various Industries</i>
1030 – 1130	Impact of Process Upsets <i>Safety Implications • Environmental Impact • Economic Consequences</i>
1130 – 1215	Troubleshooting <i>Basic Principles of Troubleshooting • Systematic Approach to Problem-Solving</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Data Collection & Analysis <i>Importance of Data in Troubleshooting • Techniques for Effective Data Collection • Tools for Data Analysis (e.g., Statistical Methods, Root Cause Analysis)</i>
1330 – 1420	Case Studies: Real-World Examples of Process Upsets <i>Analysis of Past Incidents • Lessons Learned & Best Practices</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	<i>Lunch & End of Day One</i>



Day 2: Monday, 29th of July 2024

0730 – 0830	Troubleshooting Process Equipment <i>Identifying Common Issues with Pumps, Compressors, & Heat Exchangers • Diagnostic Techniques & Tools</i>
0830 – 0930	Troubleshooting Process Control Systems <i>Understanding Control Loops & Instrumentation • Techniques for Diagnosing Control System Issues</i>
0930 – 0945	Break
0945 – 1100	Troubleshooting Chemical Processes <i>Common Issues in Chemical Reactions & Separation Processes • Techniques for Diagnosing Chemical Process Issues</i>
1100 – 1215	Root Cause Analysis (RCA) <i>Introduction to RCA Methodologies (e.g., Fishbone Diagram, 5 Whys) • Practical Application of RCA</i>
1215 – 1230	Break
1230 – 1330	Fault Tree Analysis (FTA) <i>Understanding FTA & Its Applications • Building & Analyzing Fault Trees</i>
1330 – 1420	Human Factors in Troubleshooting <i>Impact of Human Error on Process Upsets • Strategies to Mitigate Human Error</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 Two

Day 3: Tuesday, 30th of July 2024

0730 – 0830	Process Optimization <i>Definition & Objectives of Process Optimization • Key Concepts & Principles</i>
0830 – 0930	Economic Optimization <i>Understanding Cost-Benefit Analysis • Techniques for Economic Optimization (e.g., Break-Even Analysis, Marginal Cost Analysis)</i>
0930 – 0945	Break
0945 – 1100	Energy Optimization <i>Importance of Energy Efficiency • Techniques for Optimizing Energy Use in Processes</i>
1100 – 1230	Six Sigma & Lean Principles <i>Overview of Six Sigma Methodology • Lean Principles & their Application to Process Optimization</i>
1230 - 1245	Break
1245 – 1420	Case Studies: Successful Process Optimization Projects <i>Review of Real-World Optimization Projects • Analysis of Strategies & Outcomes</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: Wednesday, 31st of July 2024

0730 – 0830	Statistical Process Control (SPC) <i>Introduction to SPC & Control Charts • Application of SPC in Process Optimization</i>
0830 – 0930	Design of Experiments (DOE) <i>Understanding DOE Methodology • Application of DOE for Process Optimization</i>
0930 – 0945	Break
0945 – 1100	Optimization of Chemical Reactions <i>Techniques for Optimizing Reaction Conditions • Catalysts & their Role in Process Optimization</i>
1100 – 1215	Heat Integration & Energy Recovery <i>Principles of Heat Integration • Techniques for Energy Recovery & Reuse</i>
1215 – 1230	Break
1230 – 1330	Process Intensification <i>Introduction to Process Intensification • Techniques & Technologies for Intensifying Processes</i>
1330 – 1420	Sustainability & Green Chemistry <i>Principles of Sustainability in Process Optimization • Application of Green Chemistry Principles</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 Four

Day 5: Thursday, 01st of August 2024

0730 – 0830	Developing an Integrated Troubleshooting & Optimization Plan <i>Combining Troubleshooting & Optimization Techniques • Steps to Develop a Comprehensive Plan</i>
0830 – 0930	Risk Management & Contingency Planning <i>Identifying & Managing Risks • Developing Contingency Plans for Process Upsets</i>
0930 – 0945	Break
0945 – 1100	Implementing Process Improvements <i>Strategies for Successful Implementation • Monitoring & Measuring Improvements</i>
1100 – 1230	Continuous Improvement <i>Principles of Continuous Improvement • Tools & Techniques for Maintaining Process Gains</i>
1230 – 1245	Break
1245 – 1345	Team Collaboration & Communication <i>Importance of Teamwork in Troubleshooting & Optimization • Effective Communication Strategies</i>
1345 – 1400	Course Conclusion <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course



Practical Sessions

This practical and highly-interactive course includes the following real-life case studies and exercises:-



Course Coordinator

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