

COURSE OVERVIEW PE0115 Process Plant Performance & Efficiency

Course Title

Process Plant Performance & Efficiency

Course Date/Venue

February 10-14, 2025/Highgate 2 Meeting Room, London Marriott Hotel Regents Park, London, United Kingdom

Course Reference

PE0115

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 plant performance and efficiency. It covers the characterization of catalyst; ideal reactor and their performance; the various thermal and mechanical separation processes; the performance of crystallization, adsorption, chemisorption, and ion exchange; performance of pipelines, pumps, and compressors; the efficiency of off-site utilities such as the electrical energy, cooling water, steam, and refrigeration; and the importance of proper waste disposal and its impact on plant performance and efficiency.

At the completion of the course, participants will be able to employ systematic methodology in measurements and control technology and their major role in plant performance and efficiency; identify the various optimization tools used in process plant performance; determine the refinery and process plant optimization trends; discuss the continuous improvement, benchmarking and best practices for process plant performance and efficiency; carryout troubleshooting procedures and identify the different performance analysis software used in process plant performance in relation to process optimization and performance monitoring.

Course Objectives

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

- Apply and gain an in-depth knowledge on various elements of process plant performance in order to improve the efficiency
- Enumerate the characterization of catalyst and the ideal reactor and identify their performance
- Discuss the various thermal and mechanical separation processes and determine the performance of crystallization, adsorption, chemisorption, and ion exchange
- Recognize the performance of pipelines, pumps, and compressors as well as the efficiency of off-site utilities such as the electrical energy, cooling water, steam, and refrigeration
- Discuss the importance of proper waste disposal and its impact on plant performance and efficiency
- Employ systematic methodology in measurements and control technology and their major role in plant performance and efficiency
- Enhance knowledge on collecting various process data such as chemical data, mass balance, physicochemical data, and processing variables as inputs for process optimization procedure
- Identify the various optimization tools used in process plant performance and determine the refinery and process plant optimization trends
- Discuss the continuous improvement, benchmarking and best practices for process plant performance and efficiency
- Carryout troubleshooting procedures and identify the different performance analysis software used in process plant performance in relation to process optimization and performance monitoring

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 is intended for those concerned with the process plant performance and efficiency including planning staff, instrumentation & control staff, production & operation staff, process, electrical, mechanical and project engineers. Management can also appreciate the importance of the new tools available to achieve the plant objectives of today and meet the challenges of tomorrow.

Accommodation

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



Course Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-



Process Plant Performance & Efficiency

Haward Technology Middle East

Certification Number: 74851
 Certification Date: 15-Nov-2023
 Expiration Date: 15-Nov-2028

This is to certify that **Waleed Al Habeeb** has successfully met the requirements of the **Process Plant Performance & Efficiency** Program, PE0115.

J. Castillo
 Mr. Jaryl Castillo
 Academic Director

Haward Technology is accredited by:

Process Plant Performance & Efficiency

Haward Technology Middle East

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 Abu Dhabi, UAE
 Tel: +971 2 30 91 714
 Http://www.haward.org

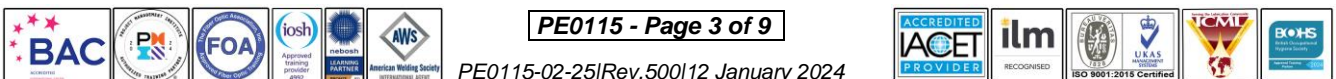
74851

Process Plant Performance & Efficiency
 Certification Program

This program is designed to assist companies in identifying professionals who have satisfied the minimum competencies specified in PE0115.

Haward Technology does not warrant or guarantee the performance of any professional certified under this program.

Haward Technology is accredited by:





- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

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Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEUs

CEU Official Transcript of Records

TOR Issuance Date: 15-Nov-23
HTME No. 74851
Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
PE0115	Process Plant Performance & Efficiency	November 11-15, 2023	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Jaryl Castillo
 Academic Director

Haward Technology has been approved as an Accredited Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2018 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2018 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 Association 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 is accredited by













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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.

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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.

Course Fee

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.

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. Mervyn Frampton is a **Senior Process Engineer** with over **30 years** of industrial experience within the **Oil & Gas, Refinery, Petrochemical** and **Utilities** industries. His expertise lies extensively in the areas of **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, Piping Systems, Applied Process Engineering Elements, Process Plant Optimization, Revamping & Debottlenecking, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Monitoring, Catalyst Selection & Production Optimization, Operations Abnormalities & Plant Upset, Process Plant Start-up & Commissioning, Clean Fuel Technology & Standards, Flare, Blowdown & Pressure Relief Systems, Oil & Gas Field Commissioning Techniques, Pressure Vessel Operation, Gas Processing, Chemical Engineering, Process Reactors Start-Up & Shutdown, Gasoline Blending for Refineries, Urea Manufacturing Process Technology, Continuous Catalytic Reformer (CCR), De-Sulfurization Technology, Advanced Operational & Troubleshooting Skills, Principles of Operations Planning, Rotating Equipment Maintenance & Troubleshooting, Hazardous Waste Management & Pollution Prevention, Heat Exchangers & Fired Heaters Operation & Troubleshooting, Energy Conservation Skills, Catalyst Technology, Refinery & Process Industry, Chemical Analysis, Process Plant, Commissioning & Start-Up, Alkylation, Hydrogenation, Dehydrogenation, Isomerization, Hydrocracking & De-Alkylation, Fluidized Catalytic Cracking, Catalytic Hydrodesulphuriser, Kerosene Hydrotreater, Thermal Cracker, Catalytic Reforming, Polymerization, Polyethylene, Polypropylene, Pilot Water Treatment Plant, Gas Cooling, Cooling Water Systems, Effluent Systems, Material Handling Systems, Gasifier, Gasification, Coal Feeder System, Sulphur Extraction Plant, Crude Distillation Unit, Acid Plant Revamp and Crude Pumping. Further, he is also well-versed in HSE Leadership, Project and Programme Management, Project Coordination, Project Cost & Schedule Monitoring, Control & Analysis, Team Building, Relationship Management, Quality Management, Performance Reporting, Project Change Control, Commercial Awareness and Risk Management.**

During his career life, Mr. Frampton held significant positions as the **Site Engineering Manager, Senior Project Manager, Process Engineering Manager, Project Engineering Manager, Construction Manager, Site Manager, Area Manager, Procurement Manager, Factory Manager, Technical Services Manager, Senior Project Engineer, Process Engineer, Project Engineer, Assistant Project Manager, Handover Coordinator** and **Engineering Coordinator** from various international companies such as the **Fluor Daniel, KBR South Africa, ESKOM, MEGAWATT PARK, CHEMEPIC, PDPS, CAKASA, Worley Parsons, Lurgi South Africa, Sasol, Foster Wheeler, Bosch & Associates, BCG Engineering Contractors, Fina Refinery, Sapref Refinery, Secunda Engine Refinery** just to name a few.

Mr. Frampton has a **Bachelor's degree** in **Industrial Chemistry** from **The City University** in **London**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** and has delivered numerous trainings, courses, workshops, conferences and seminars 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, 10th of February 2025

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction Components of the Process Plant • Performance for Management, Engineering, Operation • Most Common Performance Index • Performance for Maintenance, Operation, Equipment
0930 – 0945	Break
0945 – 1100	The Catalyst & the Reactor Catalyst Performance • Characterization of Catalyst • Kinetics of Heterogeneous Catalyst • Fundamentals of Chemical Reaction Technology • Ideal Reactors
1100 – 1230	Product Processing (Thermal & Mechanical Separation Processes) Heat Transfer, Evaporation & Condensation • Distillation, Rectification • Absorption & Desorption, Stripping, Vapor-Entrainment Distillation • Extraction • Crystallization • Adsorption, Chemisorption • Ion Exchange • Drying • Special Processes for Fluid Phases • Mechanical Processes
1230 – 1245	Break
1245 – 1420	Pipelines, Pumps & Compressors Fundamentals of Hydrodynamics • One-phase Flow in Pipelines • Pumps • Compressors
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Tuesday, 11th of February 2025

0730 – 0900	Energy Supply Steam & Condensate System • Electrical Energy • Cooling Water • Refrigeration • Compressed Air
0900 – 0915	Break
0915 – 1045	Product Supply & Storage
1045 – 1230	Waste Disposal Off-gas Collection System & Flares • Combustion Plants for Gaseous & Liquid Residues • Special Processes for Off-Gas Purification • Wastewater Purification & Disposal • Slop System





1230 – 1245	Break
1245 – 1420	Measurement & Control Technology Metrology • Control Technology
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Wednesday, 12th of February 2025

0730 – 0900	Plant Safety
0900 – 0915	Break
0915 – 1045	Materials Selection Important Materials & their Properties • Metallic Materials • Nonmetallic Materials
1045 – 1230	Process Data Chemical Data • Mass Balance • Physicochemical Data • Processing
1230 – 1245	Break
1245 – 1420	Optimization Fundamentals What can Optimization Achieve • Cost Versus Capacity • Pareto Principle • Operational Economics • Investment Economics • Financial Returns
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4: Thursday, 13th of February 2025

0730 – 0900	Optimization Fundamentals (cont'd) Basic Optimization Tools • Graphical, Analytical Methods • Advanced Optimization Tools • Linear Quadratic Programming • Non-linear Optimization
0900 – 0915	Break
0915 – 1045	Refinery & Process Plant Optimization Trends Optimization Trends • Overall Goal • Unit Optimization – Case Study
1045 – 1230	Continuous Improvement Total Quality Management Kaizen • “Just in Time” • Six Sigma • Balanced Scorecard
1230 – 1245	Break
1245 – 1420	Benchmarking & Best Practices Performance Measures & Profitability • Relative Energy Intensity Index • Relative Maintenance Index • Key Performance Indicators • Best Practices
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5: Friday, 14th of February 2025

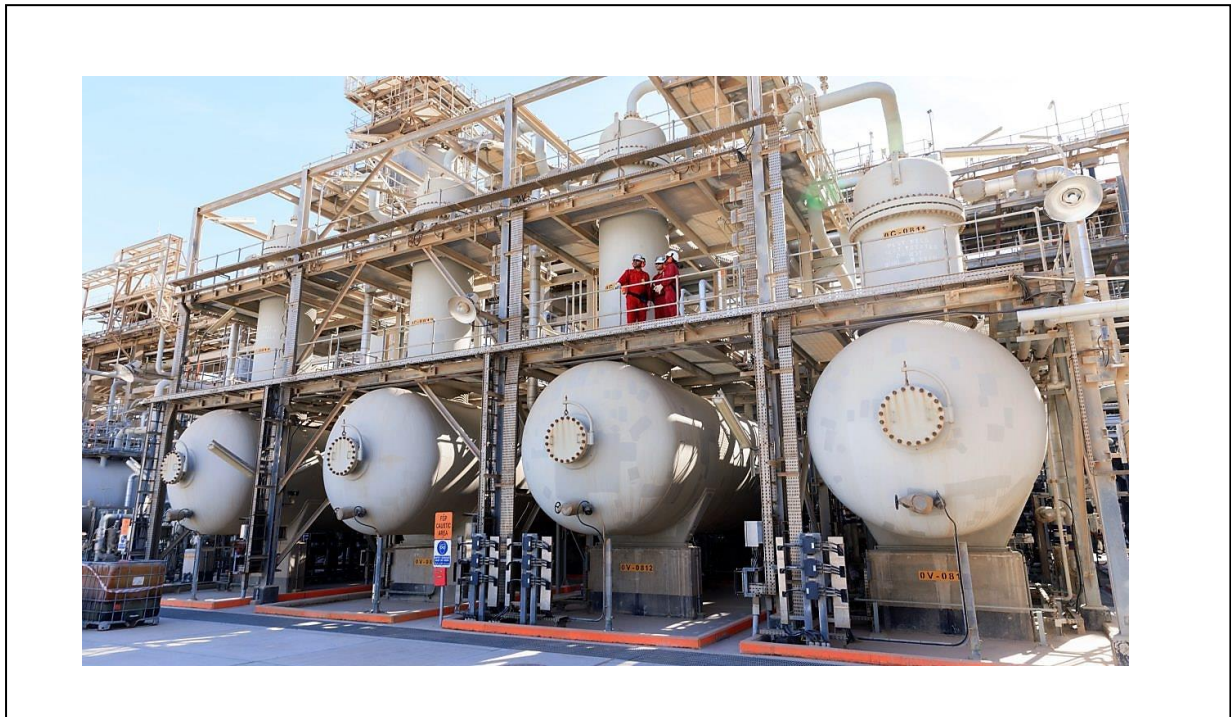
0730 – 0930	Benchmarking & Best Practices (cont'd) Model Validation • Back Casting
0930 – 0945	Break
0945 – 1100	Troubleshooting Worst Loops • Biggest Payback loops
1100 – 1200	Troubleshooting (cont'd) Detecting Oscillations • Drilling Down
1200 – 1215	Break



1215 - 1300	Performance Analysis Software <i>Processing Optimization • Performance Monitoring • Commercial Software</i>
1300 - 1315	Course Conclusion
1315 - 1415	COMPETENCY EXAM
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:-



Course Coordinator

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