COURSE OVERVIEW PE1044
LPG and NGL Plant Operation

Course Title
LPG and NGL Plant Operation

Course Reference
PE1044

Course Date/Venue
Please refer to page 3

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies 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 LPG and NGL Plant Operation. It covers the properties and production processes of LPG and NGL; the gas conditioning and treatment, LPG and NGL storage systems and safety in LPG and NGL plants; the flow diagram of LPG and NGL plants, key process equipment and their functions, material balance in LPG/NGL plants and process flow analysis and troubleshooting; the gas separation and fractionation, LPG recovery from wet gas and NGL recovery and fractionation; and the propane/butane splitter and apply NGL hydrotreating and energy management in LPG and NGL plants.

During this interactive course, participants will learn the process control systems, distillation column control, flow and pressure control and temperature and level control; the automation and advanced process control (APC) and safety instrumented systems (SIS); the routine maintenance practices, troubleshooting techniques and inspection and testing of plant equipment; the proper maintenance of compressors and pumps, shutdown and turnaround procedures and documentation and reporting in maintenance; the advancements in LPG and NGL technology and integration of LPG/NGL with other refinery units; the environmental impact and regulations and LPG and NGL market dynamics; developing training programs for operators and engineers; and building competency and expertise in LPG/NGL operations.

Course Objectives

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

- Apply and gain a comprehensive knowledge on LPG and NGL plant operation
- Identify the properties and production processes of LPG and NGL
- Carryout gas conditioning and treatment, LPG and NGL storage systems and safety in LPG and NGL plants
- Describe the flow diagram of LPG and NGL plants, key process equipment and their functions, material balance in LPG/NGL plants and process flow analysis and troubleshooting
- Illustrate gas separation and fractionation, LPG recovery from wet gas and NGL recovery and fractionation
- Identify propane/butane splitter and apply NGL hydrotreating and energy management in LPG and NGL plants
- Recognize process control systems and apply distillation column control, flow and pressure control and temperature and level control
- Discuss automation and advanced process control (APC) and safety instrumented systems (SIS)
- Employ routine maintenance practices, troubleshooting techniques and inspection and testing of plant equipment
- Apply proper maintenance of compressors and pumps, shutdown and turnaround procedures and documentation and reporting in maintenance
- Discuss the advancements in LPG and NGL technology and integration of LPG/NGL with other refinery units
- Recognize environmental impact and regulations and LPG and NGL market dynamics
- Develop training programs for operators and engineers and build competency and expertise in LPG/NGL operations

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 provides an overview of all significant aspects and considerations of LPG and NGL plant operation for process engineers, operation engineers, plant operators and technicians, maintenance engineers and supervisors, mechanical and electrical engineers and other technical staff.

Course Date/Venue

Session(s)	Date	Venue
1	May 04-08, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	July 13-17, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
3	September 22-26, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	November 23-27, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

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.

Accommodation

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

Course Fee

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

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.

- 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:

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.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of LPG & NGL*** *Definition and Properties of LPG and NGL • Differences Between LPG and NGL • Industry Applications of LPG and NGL • Role in Refinery and Petrochemical Industries*
0930 – 0945	*Break*
0945 – 1030	***LPG & NGL Production Processes*** *Gas Separation and Fractionation Processes • Role of Distillation Columns in LPG and NGL Production • Cryogenic Separation Techniques • Overview of Gas Sweetening and Dehydration Processes*
1030 – 1130	***Gas Conditioning & Treatment*** *Desulfurization and its Importance in LPG/NGL • Water Removal Methods (Glycol Dehydration, Molecular Sieves) • Amine Treating for Acid Gas Removal • Impact of Impurities on LPG and NGL Quality*
1130 – 1215	***LPG & NGL Storage Systems*** *Types of Storage Tanks and Vessels • Design Considerations for LPG and NGL Storage • Pressure and Temperature Control in Storage Systems • Safety Protocols for LPG/NGL Storage*
1215 – 1230	*Break*
1230 – 1330	***Safety in LPG & NGL Plants*** *Common Safety Hazards in LPG and NGL Plants • Safety Systems and Equipment in LPG Plants • Emergency Shutdown Systems (ESD) • Industry Safety Standards and Regulations*
1330 – 1420	***Flow Diagram of LPG & NGL Plants*** *Understanding Typical Flow Diagrams (PFDs) • Key Process Equipment and Their Functions • Material Balance in LPG/NGL Plants • Process Flow Analysis and Troubleshooting*
1420 – 1430	***Recap*** *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*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Gas Separation & Fractionation*** *Basic Principles of Separation in LPG and NGL Plants • Role of Separators and Scrubbers • Distillation Columns and Fractionators • Optimization of Separation Efficiency*
0830 – 0930	***LPG Recovery from Wet Gas*** *Recovery of Propane, Butane and Ethane • Process Conditions for Effective Recovery • Importance of Refrigeration in Recovery • Role of Absorber Towers in Recovery*
0930 – 0945	*Break*

0945 – 1100	***NGL Recovery & Fractionation*** *Techniques for NGL Recovery from Natural Gas • Fractionation Processes for Different NGL Components • Temperature and Pressure Optimization • Utilization of Absorption and Distillation*
1100 – 1215	***Propane/Butane Splitter*** *Working Principle of the Propane-Butane Splitter • Operating Parameters (Temperature, Pressure, Reflux Ratio) • Importance of Product Purity • Design and Operation of Splitters in the Plant*
1215 – 1230	*Break*
1230 – 1330	***NGL Hydrotreating*** *Process of Hydrotreating in NGL Plants • Hydrogenation of NGL Components • Catalyst Types Used in NGL Hydrotreating • Impact of Hydrotreating on Product Quality*
1330 – 1420	***Energy Management in LPG & NGL Plants*** *Energy Consumption Patterns in LPG/NGL Plants • Heat Integration and Optimization • Energy-Saving Technologies • Cost-Effectiveness of Energy Management Systems*
1420 – 1430	***Recap*** *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*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Process Control Systems*** *Overview of Control Systems Used in LPG/NGL Plants • Types of Process Control (Open-Loop, Closed-Loop) • Supervisory Control and Data Acquisition (SCADA) • Role of Instrumentation in Controlling Plant Operations*
0830 – 0930	***Distillation Column Control*** *Key Parameters for Column Operation (Temperature, Pressure, Flow) • Techniques for Controlling Reflux and Distillation Rates • Column Flooding and its Effect on Separation • Troubleshooting Common Column Issues*
0930 – 0945	*Break*
0945 – 1100	***Flow & Pressure Control*** *Principles of Flow and Pressure Control in LPG/NGL Plants • Control Valves and Actuators • Pressure Control Systems and Safety Relief Valves • Troubleshooting Flow and Pressure Issues*
1100 – 1215	***Temperature & Level Control*** *Temperature Control Systems in LPG and NGL Plants • Level Sensors and Their Role in Plant Operation • Maintaining Optimal Temperature and Level During Operation • Troubleshooting Temperature and Level Anomalies*
1215 – 1230	*Break*
1230 – 1330	***Automation & Advanced Process Control (APC)*** *Introduction to Advanced Process Control in LPG/NGL Plants • Benefits of Predictive Control and Optimization • Use of Data Analytics in Controlling Plant Performance • Role of APC in Improving Energy Efficiency*

1330 – 1420	***Safety Instrumented Systems (SIS)*** *Introduction to SIS and Their Role in Plant Safety • Design and Implementation of SIS • Functional Safety and its Importance in LPG/NGL Plants • Maintenance and Testing of SIS Components*
1420 – 1430	***Recap*** *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*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Routine Maintenance Practices*** *Types of Routine Maintenance in LPG/NGL Plants • Preventive Maintenance versus Corrective Maintenance • Commonly Used Maintenance Schedules • Tools and Equipment for Routine Checks*
0830 – 0930	***Troubleshooting Techniques*** *Common Issues in LPG/NGL Plant Operations • Step-by-Step Troubleshooting Approach • Diagnostic Tools and Instruments for Troubleshooting • Resolving Operational Inefficiencies and Failures*
0930 – 0945	*Break*
0945 – 1100	***Inspection & Testing of Plant Equipment*** *Types of Equipment Inspections (Visual, Ultrasonic, etc.) • Pressure Testing of Storage Vessels and Pipelines • Inspection Techniques for Gas Compressors and Turbines • Non-Destructive Testing (NDT) in LPG/NGL Plants*
1100 – 1215	***Maintenance of Compressors & Pumps*** *Principles of Compressor Operation in LPG/NGL Plants • Common Faults in Compressors and Troubleshooting • Maintenance Schedules for Pumps and Valves • Techniques for Improving Pump and Compressor Reliability*
1215 – 1230	*Break*
1230 – 1330	***Shutdown & Turnaround Procedures*** *Steps for Safe Plant Shutdown and Start-Up • Planning and Scheduling of Plant Turnarounds • Key Considerations for Plant Decommissioning • Coordinating Safety During Shutdown Operations*
1330 – 1420	***Documentation & Reporting in Maintenance*** *Importance of Maintaining Accurate Maintenance Logs • Commonly Used Reporting Systems in LPG/NGL Plants • How to Create Maintenance Reports • Using Software for Maintenance Management*
1420 – 1430	***Recap*** *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*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Advancements in LPG & NGL Technology*** *Emerging Technologies in LPG and NGL Processing • Role of Automation in Plant Optimization • Future Trends in Gas Fractionation and Recovery • Green Technologies and Sustainable Practices in LPG/NGL Plants*
0830 – 0930	***Integration of LPG/NGL with Other Refinery Units*** *Synergies Between LPG/NGL and Crude Distillation Units • Integrated Plant Operation for Efficiency • Cross-Department Coordination in Refining Operations • Case Studies of Integrated LPG/NGL Plants*

0930 – 0945	*Break*
0945 – 1100	***Environmental Impact & Regulations*** *Environmental Impact of LPG/NGL Operations • Regulatory Standards for LPG/NGL Plants (EPA, OSHA) • Waste Management and Emissions Control in LPG/NGL Plants • Sustainable Practices in LPG/NGL Operations*
1100 – 1215	***LPG & NGL Market Dynamics*** *Global Market Trends for LPG and NGL • Pricing Mechanisms and Economic Factors • Export and Transportation of LPG and NGL • Market Drivers and Challenges in the LPG/NGL Sector*
1215 – 1230	*Break*
1230 – 1300	***Training & Skill Development in LPG/NGL Plants*** *Training Programs for Operators and Engineers • Certification and Continuous Learning for Plant Workers • Role of Simulation in Training for LPG/NGL Plants • Building Competency and Expertise in LPG/NGL Operations*
1300 – 1335	***Future of LPG/NGL Industry*** *Future Direction in LPG/NGL Processing • Innovations in Refining and Gas Separation • Long-Term Strategies for Operational Excellence • Impact of Digitalization on the LPG/NGL Sector*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This hands-on, highly-interactive course includes the real-life case studies and exercises:-

Course Coordinator

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