

COURSE OVERVIEW PE0945 Oil Production & Processing Facilities

Course Title

Oil Production & Processing Facilities

Course Date/Venue

Session 1: May 26-30, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: November 16-20, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Duration

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.

With 70% of world oil assets in the mature phase, and world energy demand expected to increase at an annual rate of 1- 2% over the next 15 years. Reaching an annual demand of 107 million barrels per day by 2020, the need for effective Production Operations to meet this demand is evident.



This course covers the basic concepts and latest techniques necessary to design, specify, operate and manage modern oil field production and processing facilities. It provides a clear understanding of the equipment and processes used in common separation and oil and water treating systems as well as the selection of piping and pumping systems. The gathering, separation and final treatment systems for crude oil, before transport to refinery are discussed. The concepts of export quality crude, field and fiscal measurements error is explained. Hydrocarbon reconciliation and allocation of produced fluids to the contributing reservoirs are explained. Exercises and case studies are used to explain the learning of the various topics discussed. This course will enable participant to develop a “feel” for the important parameters of designing and operating a modern production facility. The participant will understand the uncertainties and assumptions inherent in designing and using the equipment in these systems and the limitations, advantages and disadvantages associated with their use.



As some of course participants may have no background in production facility design other than what they have learned in the introductory petroleum engineering courses, the course will start with an overview explaining the goals of the facility with pictures of the equipment. Then the instructor will discuss how the equipment is put together into a process system before explaining process calculations and equipment designing procedures. The instructor will assign a project at the start of the course and have the participants take it another step forward as each day is completed. As there are many correct answers in facility process and equipment design, no two projects will be identical, but the participant should be able to defend his/her selection in an oral presentation at the last day of the course.

Course Objectives

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

- Apply fundamental concepts and techniques necessary to design, specify, operate and manage process facility
- Identify the various processes within the modern oil production facility such as oil and gas separation, crude oil treatment, desalting, sweetening, pigging, water injection, gas conditioning & processing etc.
- Demonstrate good working knowledge on oil storage, loading, metering and measurement systems and be able to identify and select various equipment and components of oil production and processing facilities such as piping, valves, pumps, fired equipment, heat exchangers, relief systems, wellheads and well test equipment
- Analyze various production problems and recommend possible solutions to troubleshoot and solve such problems to improve the total performance of the oil production and processing facility

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 newly-engaged production engineers, petroleum engineers, field operation technical staff and management, instrumentation and process control engineers, technical and operations staff from other disciplines who would require a cross-training or basic understanding of the modern oil production operations and facilities.

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 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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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.

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. 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, 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

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0845 – 0930	The Oil Production Facility Facility Description • Making the Equipment Work • Facility Types
0930 – 0945	Break
0945 – 1100	Choosing the Production Process Process Selection • Controlling the Process • Basic System Configuration • Well Testing • Gas Lift • Offshore Platform Considerations
1100 – 1215	Fluid Properties (Oil, Gas & Water) Basic Principles • Flash Calculations • Characterizing the Flow Stream • Approximate Flash Calculations • Other Properties
1215 – 1230	Break
1230 – 1315	Emulsions & Emulsion Treatment Nature of Emulsion • Factors Affecting Emulsion Tendency • Demulsifier Injection Points • Dose Calculation
1315 – 1400	Two-Phase Oil and Gas Separation Factors Affecting Separation • Equipment Description • Horizontal vs. Vertical Vessel Selection • Vessel Internals • Potential Operating Problems • Separator Sizing
1400 – 1420	Oil & Water Separation Equipment Description • Vessel Internals • Emulsions • Separator Sizing
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0830	Crude Oil Treating Systems Emulsion Treating • Gravity Separation • Treating Equipment • Equipment Sizing • Design Procedure
0830 – 0930	Crude Oil Desalting Salt Problem • Salt Specs • Oil & Water Mixing • Processes • Equipment
0930 – 0945	Break
0945 – 1030	Crude Stabilization & Sweetening H ₂ S Problem • H ₂ S Specs • Oil Vapour Pressure • Physical Solvents • Sweetening Processes • Equipment
1030 – 1115	Produced-Water Treating Systems System Description • Treating Equipment • Drain Systems • Information Required for Design • Influent Water Quality • Equipment Selection Procedure • Equipment Specification
1115 – 1230	Oil Storage Tanks & Tank Farm Tank Measurements • Safety & Protection Systems • Operating Manuals, PFDs and P&IDs • Tank Operations • Tanks Overflow Safeguards • Types of Floating Roof Seals • Double Seal System • Fire Detection and Fire Fighting Systems • Tanks Emptying Procedure for Maintenance and Re-commissioning • Tanks Draining Operation
1230 – 1245	Break
1245 – 1420	Oil Loading Operations Tank Loading Operation and Procedure • Causes of Loading Interruptions • Ship & Shore Figures
1420 – 1430	Recap
1600	Lunch & End of Day Two

Day 3

0730 – 0830	Crude Metering & Measurements Accuracy & Measurement • Flow Measurement • Level Measurement • Calibration & Prover Systems • Tank Gauging & Quality Assessment • Pipeline Flowmeters & Selection Criteria • Leak Detection & Loss Control • Multiphase Flowmetering
0830 – 0930	Pressure Drop in Piping Basic Principles • Fluid Flow Equations • Head Loss in Valves and Pipe Fittings
0930 – 0945	Break
0945 – 1045	Choosing a Line Size and Wall Thickness Line Size Criteria • Wall Thickness Criteria • Pressure Rating Classes
1045 – 1145	Piping & Associated Equipment Piping Protection System • Operating Manual, PFDs and P&IDs • Pipes Stagnancy • The Hazards of Blocked Pipe Work • Permissible Overpressure Above Design Procedure with Reference to International Standards • Piping Material & Ratings • Pipe Heat Tracing
1145 – 1230	Valves (Isolating, Check, Control, ESV's, & XV's Valves) Valve Types • Valve Selection • Operating Manual, PFDs and P&IDs • Common Operating Problems • Isolating a Valve for Maintenance • Partial & Full Closure Test • Valve Actuator Operating Modes • Leak Test/Seat Leakage Test
1230 – 1245	Break

1245 – 1330	Valves (Isolating, Check, Control, ESV's, & XV's Valves) Valve Types • Valve Selection • Operating Manual, PFDs and P&IDs • Common Operating Problems • Isolating a Valve for Maintenance • Partial & Full Closure Test • Valve Actuator Operating Modes • Leak Test/Seat Leakage Test
1330 – 1420	Pumps Types of Pumps • Pump Selection • Pumps Protection System • Normal Start-up/Shutdown Procedures of Centrifugal & Positive Displacement Pumps • Cavitations • Common Operating Parameters/Problems • Isolation Procedure for Maintenance
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

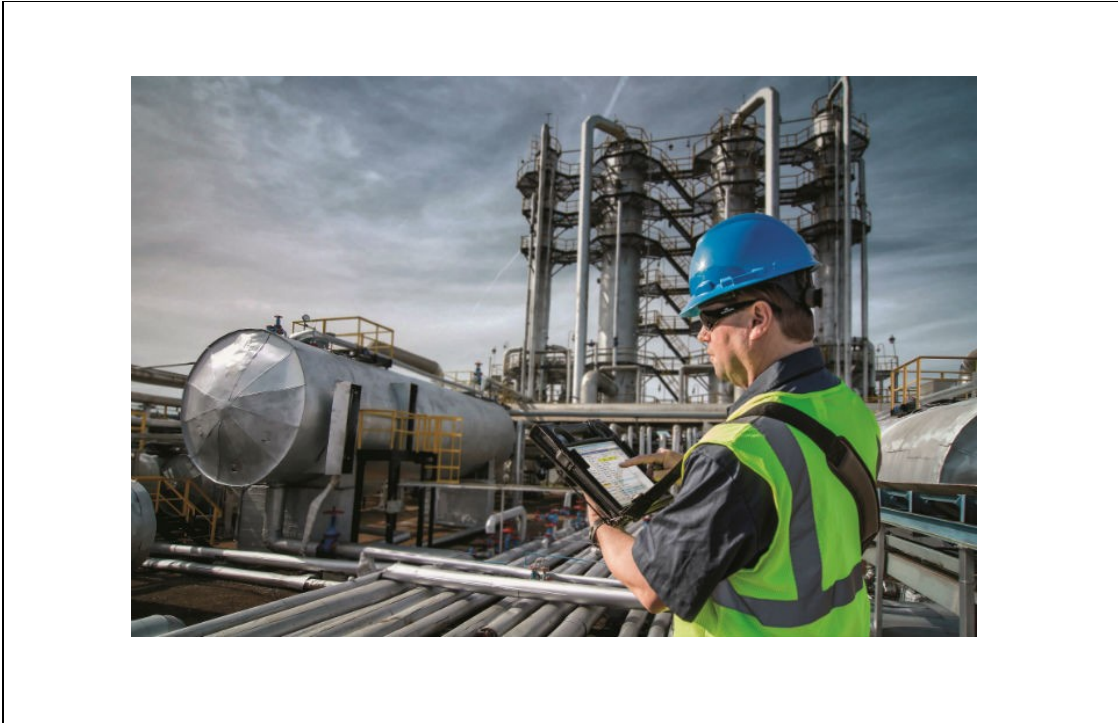
0730 – 0830	Pipeline Operations Pipeline Design Condition/Rating • Pipeline Commissioning/Decommissioning • Pipeline De-pressurization Procedure • Pipeline Corrosion Protection • Operating Manual, PFDs and P&IDs • Sectionalizing & Blow-off Valves
0830 – 0930	Pigging Operations Types of Pigs & Selecting Criteria • Effect of Pigging Operation on Up/Down Stream Plants • Opening/Closing Procedure for Pig Trap Door and Seal Mechanism • Pig Traveling Time Estimations • Insulation Flanges/Monoblock at Pig Launchers/Receivers • Intelligent Pigging • Operational Problems (Stuck Pig, Removing of Stuck Pig)
0930 – 0945	Break
0945 – 1100	Water Injection Plant Design Concepts • Types and Components of the Water Injection Plant • Product Specifications • Protection/Control System
1100 – 12000	Injection Water Treatments & Conditioning Injection Water Quality Control • Selection Criteria for Water Treatment Chemicals • Chemical Injection Points in the System • The Filter Control System • Water Hammering • Water Injection Protection System
1200 – 1230	Gas Injection Plant Design Concepts • Major Components • Operation Procedures • Product Specifications • Protection/Control System
1230 – 1245	Break
1245 – 1345	Gas Conditioning & Processing Contract Terms • Separators • Slug Catcher • Twister Super Sonic Separator • Water Contents & Dew Point • Hydrate & Dehydration • Enhanced Glycol Concentration • Solid Desiccant • Hydrocarbon Recovery • Refrigeration • Removal of Acid Gases • Liquid Ethane Recovery • Gas Sweetening & Sulphur Recovery • Amine Process • Sulfinol Process • Claus Process
1345 – 1420	Compressors Design Concept • Types of Compressors & Their Application • Dry and Wet Seals & Their Uses
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0830	Fired Equipment Types of Fired Equipment & Selection Criteria • Direct & Indirect Methods to Quantify the Furnace Efficiency • The Chemical Reactions Detail that Lead to the Formation of SO _x , NO _x , CO and Soot During Combustion • Furnace Light Procedure • The Maximum Allowable Heat Flux
0830 – 0930	Heat Exchanger/Heat Recovery Types of Heat Exchangers • Permissible/Critical Operating Parameters for Heat Exchanger Design • Operating Manual • Protection System • Basic Equation for Heat Exchanger • Heat Recovery Optimization • Fouling Causes and Effect
0930 – 0945	Break
0945 – 1045	Flare, Blowdown & Pressure Relief Systems Product Specs • Flow Measurement • Instrumentation & Sensing Devices • Control Systems • Relief Systems • Relieving Devices • Flare Systems • Codes, Standards & Recommended Practices • Product Storage • Product Recovery • Waste Heat Recovery
1045 – 1130	Well Test Equipment Test Equipment in a Barge or Truck • Protection System for the Test Equipment • Operating Manuals / Procedures / P&ID • Types of Well Tests • Test Equipment Constraints • Safety Precautions and Regulation Needs for Operation at the Test Barge or Truck
1130 – 1215	Wellhead & Xmas Trees Opening and Closing of a Production, Water Injector & Gas Injector Well After/Before Shutdown • Opening and Closing of Wellhead During Normal Operations • Operating Manual, PFDs and P&IDs
1215 – 1230	
1230 – 1300	Special Production Problems Asphaltenes • Waxes • Sand • Toxic-Materials Production • Hydrates • Water Control • Inorganic –Scale Formation • Corrosion
1300 – 1345	Assignment Presentation By Participants
1345 – 1400	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Covered During the Course
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	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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