COURSE OVERVIEW PE0140
Surface Facilities Operations & Process

Course Title
Surface Facilities Operations & Process

Course Date/Venue
September 02-06, 2024/Online Virtual Training

Course Reference
PE0140

Course Duration/Credits
Five days/2.0 CEUs/20 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 covers the basic concepts and techniques necessary to design, specify and manage oil and gas field production 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 course will cover gas dehydration, gas processing and the selection of compressor system. The gathering, separation and final treatment systems for crude oil and natural gas, before transport to refinery is discussed. The concepts of export quality crude oil and natural gas, field and fiscal measurements error is explained. Hydrocarbon reconciliation and allocation of produced fluids to the contributing reservoirs are explained. Exercises are used to cement the learning of the various topics treated.

This course will enable participant to develop a “feel” for the important parameters of designing and operating a 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.

Course Objectives

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

- Apply and gain an in-depth knowledge on surface production operations within oil and gas field production facilities
- Enumerate the different types and functions of a petroleum production facility and how to make equipment work
- Implement the proper methodology of choosing a process that would be applicable to the system and identify the system configuration
- Describe the basic principles of fluid properties, its flash calculations and characterization as well as the principles of pressure drop in piping and calculate fluid flow equations
- Discuss the factors affecting two-phase oil and gas separation including equipment description, difference between horizontal and vertical vessel selection, identify potential operating problems and cite examples
- Explain and demonstrate the process of oil and water separation and gas dehydration including the equipments used in each process
- Explain crude oil treating systems through the emulsion treating theory, gravity separation, treating equipment and equipment sizing and theory
- Employ the theory of produced-water treating systems through listing the information required for design and implementing the equipment selection procedure with its specification by taking into consideration the criteria of measurement
- Identify the different classification of pumps, principles, selection criteria, installation and specific speed in accordance with related codes and standards
- Apply the proper methodology of gas processing including absorption and refrigeration
- Enumerate the different types of compressors and explain the components, sizing and process consideration of each type
- Employ the role of optimization and its practical application in the upstream industry

Who Should Attend

This course covers systematic techniques and methodologies on surface production operations in oil and gas field production facilities for newly engaged production engineers, process engineers, facility engineers and petroleum engineers. It is also suitable for technical and operations staff from other disciplines, who require a cross-training to or a basic understanding of the surface production operation in oil and gas fields. Further, this course is suitable for all technical and operational staff who are working in onshore and offshore oil/gas fields.

Virtual Training (If Applicable)

If this course is delivered online as a Virtual Training, the following limitations will be applicable:-

Certificates	Only soft copy certificates will be issued to participants through Haward's Portal. This includes Wallet Card Certificates if applicable
Training Materials	Only soft copy Training Materials (PDF format) will be issued to participant through the Virtual Training Platform
Training Methodology	80% of the program will be theory and 20% will be practical sessions, exercises, case studies, simulators or videos
Training Program	The training will be for 4 hours per day starting at 0930 and ending at 1330
H-STK Smart Training Kit	Not Applicable
Hands-on Practical Workshops	Not Applicable
Site Visit	Not Applicable
Simulators	Only software simulators will be used in the virtual courses. Hardware simulators are not applicable and will not be used in Virtual Training

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$ 2,750 per Delegate + **VAT**.

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: -

- 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 **2.0 CEUs** (Continuing Education Units) or **20 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.

- 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. Chris Kapetan, PhD, MSc, BSc, is a **Senior Process & Petroleum Engineer** with over **30 years** of international experience within the **onshore** and **offshore oil and gas** industry. His wide experience covers **Surface Production & Operation**, **Petroleum Production** Facility, **Offshore Platform** Consideration, **Oil & Gas Separation**, **Oil & Water Separation**, **Crude Oil Treating**, **Centrifugal & Reciprocating Pumps**, **Gas Dehydration & Processing**, **Reciprocating Compressors**, **Cased Hole Formation Evaluation**, **Cased Hole Logs**, **Production Operations**, **Surface Facilities**, **Production Management**, **Drilling Operations**, **Directional Drilling**, **Gas Lift Operations**, **Petroleum Business**, **Petroleum Economics**, **Gas Lift Valve Changing** & **Installation**, **Horizontal & Multilateral Wells**, **Directional Planning**, **Completion Design**, **Directional Surveying**, **Drilling Fluids**, **Matrix Acidizing**, **Hydraulic Fracturing**, **Well Completion Design** & **Operation**, **Well Stimulation** & **Control** and **Workover Planning**, **Completions** & **Workover**, **Rig Sizing**, **Hole Cleaning** & **Logging**, **Well Completion**, **Servicing** and **Work-Over Operations**, Practical **Reservoir Engineering**, **X-mas Tree & Wellhead Operations**, **Maintenance** & **Testing**, **Advanced Petrophysics/Interpretation** of **Well Composite**, **Construction Integrity** & **Completion**, **Coiled Tubing Technology**, **Corrosion Control**, **Wireline & Coil Tubing**, **Pipeline Pigging**, **Corrosion Monitoring**, **Cathodic Protection** as well as **Root Cause Analysis** (**RCA**), **Root Cause Failure Analysis** (**RCFA**), **Gas Conditioning & Process Technology**, **Production Safety** and **Delusion of Asphalt**. Currently, he is the **Operations Manager** at **GEOTECH** and an independent **Drilling Operations Consultant** of various engineering services providers to the international clients as he offers his expertise in many areas of the **drilling discipline** and is well **recognized & respected** for his process and procedural expertise as well as ongoing participation, interest and experience in continuing to promote technology to producers around the world.

Throughout his long career life, Dr. Chris has worked for many international companies and has spent several years **managing** technically **complex wellbore interventions** in both **drilling** & **servicing**. He is a **well-regarded** for his **process** and **procedural expertise**. Further, he was the **Operations Manager** at **ETP Crude Oil Pipeline Services** where he was fully responsible for optimum operations of crude oil pipeline, **workover** and **directional drilling**, **drilling rigs** and equipment, drilling of various geothermal deep wells and **exploration wells**. Dr. Chris was the **Drilling** & **Workover Manager** & **Superintendent** for **Kavala Oil** wherein he was responsible for supervision of **drilling operations** and **offshore exploration**, quality control of performance of **rigs**, **coiled tubing**, crude oil transportation via pipeline and abandonment of **well** as per the API requirements. He had occupied various key positions as the **Drilling Operations Consultant**, **Site Manager**, **Branch Manager**, **Senior Drilling** & **Workover Manager** & **Engineer** and **Drilling** & **Workover Engineer** in several petroleum companies responsible mainly on an **offshore** sour oil field (under water flood and gas lift) and a gas field. Further, Dr. Chris has been a **Professor** of the **Oil Technology College**.

Dr. Chris has **PhD** in **Reservoir Engineering** and a **Master** degree in **Drilling & Production Engineering** from the **Petrol-Gaze Din Ploiesti University**. Further, he is a **Certified Surfaced BOP Stack Supervisor** of **IWCF**, a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and has conducted **numerous short courses**, **seminars** and **workshops** and has published several technical books on **Production Logging**, **Safety Drilling Rigs** and **Oil Reservoir**.

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, 02nd of September 2024***

0930 – 0940	*Registration, Coffee, Welcome & Introduction*
0940 – 0945	***PRE-TEST***
0945 – 1015	***The Petroleum Production Facility*** *Facility Description ● Making the Equipment Work ● Facility Types*
1015 – 1020	*Break*
1020 – 1100	***Choosing a Process*** *Process Selection ● Controlling the Process*
1100 – 1155	***Choosing a Process (cont'd)*** *Basic System Configuration ● Well Testing ● Gas Lift ● Offshore Platform Considerations*
1155 – 1200	*Break*
1200 – 1245	***Fluid Properties*** *Basic Principles ● Flash Calculations ● Characterizing the Flow Stream ● Approximate Flash Calculations ● Other Properties*
1245 – 1325	***Project Assignment***
1325 – 1330	***Recap***
1330	*End of Day One*

Day 2: ***Tuesday, 03rd of September 2024***

0930 – 1015	***Two-Phase Oil & Gas Separation*** *Factors Affecting Separation ● Equipment Description ● Horizontal vs. Vertical Vessel Selection ● Vessel Internals*
1015 – 1020	*Break*
1020 – 1100	***Two-Phase Oil & Gas Separation (cont'd)*** *Potential Operating Problems ● Theory ● Separator Sizing ● Examples*
1100 – 1155	***Oil & Water Separation*** *Equipment Description ● Vessel Internals ● Emulsions*
1155 – 1200	*Break*
1200 – 1245	***Oil & Water Separation (cont'd)*** *Theory ● Separator Sizing ● Examples*
1245 – 1325	***Project Assignment***
1325 – 1330	***Recap***
1330	*End of Day Two*

Day 3: ***Wednesday, 04th of September 2024***

0930 – 1015	***Crude Oil Treating Systems*** *Emulsion Treating Theory ● Gravity Separation ● Treating Equipment ● Equipment Sizing & Theory ● Design Procedure ● Examples*
1015 – 1020	*Break*
1020 – 1100	***Produced-Water Treating Systems*** *System Description ● Theory ● Treating Equipment*
1100 – 1155	***Produced-Water Treating Systems (cont'd)*** *Drain Systems ● Information Required for Design ● Influent Water Quality ● Equipment Selection Procedure ● Equipment Specification ● Examples: Design the Produced-Water Treating System for the Data Given*

1155 – 1200	*Break*
1200 – 1245	***Pressure Drop in Piping*** *Basic Principles ● Fluid Flow Equations ● Head Loss in Valves & Pipe Fittings ● Example Pressure Drop Calculations*
1245 – 1325	***Project Assignment***
1325 – 1330	***Recap***
1330	*End of Day Three*

Day 4: ***Thursday, 05th of September 2024***

0930 – 1015	***Choosing a Line Size & Wall Thickness*** *Line Size Criteria ● Wall Thickness Criteria ● Pressure Rating Classes ● Examples*
1015 – 1020	*Break*
1020 – 1100	***Pumps*** *Pump Classification ● Centrifugal Pumps ● Reciprocating Pumps ● Diaphragm Pumps ● Rotary Pumps ● Multiphase Pumps ● Basic Principles ● Basic Selection Criteria*
1100 – 1155	***Centrifugal Pumps*** *Multiples Pump Installations ● Pump Specific Speed ● Codes and Standards ● Generic Types of Centrifugal Pumps ● Bearings, Seals & Wear Rings ● Installation Considerations*
1155 – 1200	*Break*
1200 – 1245	***Reciprocating Pumps*** *Controlling Pulsating Flow ● Bearings, Valves and Packing ● Codes and Standards ● Piping Hookup ● Operation*
1245 – 1325	***Project Assignment***
1325 – 1330	***Recap***
1330	*End of Day Four*

Day 5: ***Friday, 06th of September 2024***

0930 – 1015	***Gas Dehydration*** *Water Content Determination ● Glycol Dehydration ● Glycol Dehydration Example ● Solid Bed Dehydration ● Dry Desiccant Design Example*
1015 – 1020	*Break*
1020 – 1100	***Gas Processing*** *Absorption/Lean Oil ● Refrigeration ● Choice of Process*
1100 – 1155	***Compressors*** *Types of Compressors ● Specifying a Compressor ● Reciprocating Compressors-Process Considerations ● Centrifugal Compressors – Surge Control and Stonewalling ● Centrifugal Compressors Process Considerations*
1155 – 1200	*Break*
1200 – 1230	***Reciprocating Compressors*** *Components ● Cylinder Sizing ● Rod Load ● Cooling and Lubrication Systems ● Pipe Sizing Considerations ● Example Problem*
1230 – 1310	***Optimization in Upstream Industry***
1310 – 1315	***Course Conclusion***
1315 – 1330	***POST-TEST***
1330	*End of Course*

Practical Sessions

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

Course Coordinator

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