COURSE OVERVIEW PE0439
Gas Compression System Design

Course Title
Gas Compression System Design

Course Date/Venue
February 17-21, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
PE0439

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 intermediate overview of Operation of Compression Systems. It covers the compression systems used in crude treatment facilities; the operating principles of compression equipment; the operational procedures for normal operations including safety protocols; the key systems components and functions like compressors, scrubbers and valves; the different operational modes and capacities of compression systems; the daily operation procedures for starting up, normal operation and shutting down compression systems; recording, registering and analyzing process parameters; and the instruments and controls associated with compression systems.

During this interactive course, participants will learn the techniques for identifying and reporting abnormal conditions; the initial troubleshooting methods; the maintenance handover and reinstatement procedures; the best practices for effective communication and coordination with maintenance teams; the advanced operational techniques, routine and non-routine operational activities; the performance enhancement, environmental and safety improvements; and the techniques for coaching others on the operation of compression systems.

Course Objectives

At the end of this course, the Trainee will be able to:-

- Apply and gain a good working knowledge on compression systems operation
- Describe the operating principles of the compression system and equipment at crude treatment facilities (gathering centre, EPF, heavy oil, etc)
- Describe operational modes and capacities of compression systems and equipment (including CRU (Condensate Recovery Unit) and TV compressors)
- Analyse process parameters and variables changes as per daily readings
- Record and register process parameters in daily logs for the compression system
- Apply KOC operational procedures and standards for normal operations, start up and shut down, handover (preparation) for maintenance and reinstatement after maintenance for compression systems
- Coordinate system and equipment malfunctions and failures with maintenance department
- Describe instrument and control systems associated with compression systems
- Report abnormal system and equipment conditions to panel operator and perform initial troubleshooting
- Operate compression system and equipment (compressors, scrubbers, valves, etc.) within area of responsibility
- Perform routine and non-routine operational activities for compression systems
- Coach others on the operation of compression systems and equipment
- Discuss the compression systems used in crude treatment facilities and how compression systems and equipment like CRU and TV compressors work
- Review KOC operational procedures for normal operations including safety protocols
- Identify the key systems components and functions like compressors, scrubbers and valves
- Discuss the different operational modes and capacities of compression systems
- Carryout daily operation procedures for starting up, normal operation and shutting down compression systems
- Record and monitor daily readings in logs and analyze process parameters
- Recognize the instruments and controls associated with compression systems
- Employ techniques for recognizing and reporting system anomalies to the panel operator
- Carryout initial troubleshooting strategies for common issues
- Prepare systems for maintenance and reinstating after work is complete
- Apply best practices for effective communication and coordination with maintenance teams

- Use advanced methods for optimizing system operation within responsibility areas
- Understand routine and non-routine operational activities and identify opportunities to improve system performance and efficiency
- Integrate environmental and safety improvements into daily operations
- Coach others on the operation of compression systems

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 intermediate overview of all significant aspects and considerations of operation of compression systems for process engineers and mechanical engineers working in the petroleum and petrochemical industry, plant supervisors, senior gas engineers, gas compressor engineers and designers, compression equipment sales engineers and fresh graduate engineers with petroleum and industrial engineering degrees. The course is a must for all technical staff working in gas plant and natural gas feedstock function.

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 H-STK® (Haward Smart Training Kit), 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 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, 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 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***
– 0930	***Introduction to Compression Systems:*** *Overview of Compression Systems Used in Crude Treatment Facilities including Gathering Centers, EPF & Heavy Oil Operations*
0930 – 0945	*Break*
0945 – 1015	***Operating Principles of Compression Equipment:*** *Detailed Exploration of How Compression Systems & Equipment Like CRU & TV Compressors Work*
1015-1100	***Safety Protocols & Operational Standards:*** *Review of KOC Operational Procedures for Normal Operations including Safety Protocols*
1100 – 1200	***System Components & Functions:*** *Identification & Function of Key Components such as Compressors, Scrubbers & Valves*
1200 - 1215	*Break*
1215 – 1315	***Operational Modes & Capacities****: Discussing Different Operational Modes & Capacities of Compression Systems*
1315 - 1420	***Interactive Session:*** *Q&A to Reinforce Understanding of System Operations & Principles*
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Daily Operation Procedures:*** *Detailed Procedures for Starting Up, Normal Operation & Shutting Down Compression Systems*
0830 - 0930	***Recording & Registering Process Parameters:*** *How to Effectively Record & Monitor Daily Readings in Logs*
0930 – 0945	*Break*
0945 – 1100	***Analyzing Process Parameters:*** *Understand How to Interpret Changes in Process Parameters & Variables*
1100 – 1200	***Instrumentation & Control Systems:*** *Overview of the Instruments & Controls Associated with Compression Systems*
1200 – 1215	*Break*
1215 – 1315	***Simulation Exercise:*** *Simulated Operation Scenarios to Apply Knowledge in a Controlled Environment*
1315 - 1420	***Discussion:*** *Impact of Operational Variables on System Efficiency & Performance*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Identifying & Reporting Abnormal Conditions:*** *Techniques for Recognizing & Reporting System Anomalies to the Panel Operator*
0830 - 0930	***Initial Troubleshooting Methods:*** *Initial Troubleshooting Strategies for Common Issues*
0930 – 0945	*Break*
0945 – 1200	***Maintenance Handover & Reinstatement Procedures:*** *Processes for Preparing Systems for Maintenance & Reinstating After Work is Complete*
1200 – 1215	*Break*
1315 - 1420	***Coordination with Maintenance Department:*** *Best Practices for Effective Communication & Coordination with Maintenance Teams*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Case Studies:*** *Review of Real-World Examples of System Malfunctions & Resolution Strategies*
0930 – 0945	*Break*
0945 – 1100	***Group Activity:*** *Role-Playing Exercise for Troubleshooting & Maintenance Coordination*
1100 – 1200	***Advanced Operational Techniques:*** *Exploring Advanced Methods for Optimizing System Operation within Responsibility Areas*
1200 – 1215	*Break*
1215 - 1420	***Routine & Non-Routine Operational Activities:*** *Understanding the Distinction & Approach to Routine Versus Non-Routine Tasks*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 5

0730 – 0830	***Performance Enhancement:*** *Identifying Opportunities for Improving System Performance & Efficiency*
0930 – 0945	*Break*
0945 – 1100	***Environmental & Safety Improvements:*** *Integrating Environmental & Safety Improvements into Daily Operations*
1100 – 1200	***Coaching & Leadership Skills:*** *Techniques for Coaching Others on the Operation of Compression Systems*
1200 – 1215	*Break*
1215 - 1400	***Final Evaluation & Feedback Session:*** *Assessment of Understanding & Feedback on Course Content*
1400 – 1415	***Course Conclusion***
1415 – 1430	***POST-TEST***
1430	*Lunch & End of Course*

Practical Sessions

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

Course Coordinator

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