COURSE OVERVIEW PE0190
Blow Down System

Course Title
Blow Down System

Course Date/Venue
Session 1: February 16-20, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: August 18-22, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
PE0190

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

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Blow Down System. It covers the purpose and importance of blow down systems in petroleum operations; the principles of pressure and temperature control and the types and components of blow down systems; the regulatory and industry standards and design criteria for blow down systems; the blow down valve selection and sizing as well as flare system and knockout drum design; the process simulation tools and dynamic blow down studies for emergency situations; and the pressure transients and blow down time calculations and the impact of blow down on process equipment.

Further, the course will also discuss the environmental and safety considerations in blow down design; the best practices in blow down system engineering; the blow down system start-up and shutdown procedures including routine inspection and preventive maintenance; troubleshooting common blow down system issues; the emergency blow down scenarios and response; and the digital monitoring and control of blow down systems; and the safety and compliance in blow down operations.

During this interactive course, participants will learn the hazard identification and risk assessment for blow down; the blow down system safety and integrity management; the environmental impact of blow down operations; the emergency response and blow down system failures; the legal and regulatory compliance in blow down systems; and the future trends and innovations in blow down systems.

Course Objectives

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

- Apply and gain an in-depth knowledge on blow down system
- Discuss the purpose and importance of blow down systems in petroleum operations
- Explain the principles of pressure and temperature control and identify the types and components of blow down systems
- Review regulatory and industry standards and design criteria for blow down systems
- Carryout blow down valve selection and sizing as well as flare system and knockout drum design
- Recognize process simulation tools, dynamic blow down studies for emergency situations, pressure transients and blow down time calculations and the impact of blow down on process equipment
- Discuss the environmental and safety considerations in blow down design and apply best practices in blow down system engineering
- Employ blow down system start-up and shutdown procedures including routine inspection and preventive maintenance
- Troubleshoot common blow down system issues and apply emergency blow down scenarios and response
- Recognize digital monitoring and control of blow down systems as well as carryout safety and compliance in blow down operations
- Carryout hazard identification and risk assessment for blow down including blow down system safety and integrity management
- Apply environmental impact of blow down operations and emergency response and blow down system failures
- Discuss the legal and regulatory compliance in blow down systems and future trends and innovations in blow down 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

The course covers systematic techniques and methodologies on the blow down system for supervisors and managers, boiler operators, maintenance technicians, safety officers, plant engineers, control room operators, environmental compliance officers and new hires/entry-level technicians.

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.

Accommodation

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

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 Instructor

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 **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**, **Project Engineering Manager**, **Construction Manager**, **Site Manager**, **Area Manager**, **Procurement Manager**, **Factory Manager**, **Technical Services Manager**, **Senior Project 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 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***
0830 – 0930	***Overview of Blow Down Systems*** *Purpose and Importance in Petroleum Operations • Differences Between Blow Down and Pressure Relief Systems • Key Components of Blow Down Systems • Role of Blow Down in Process Safety*
0930 - 0945	*Break*
0945 - 1045	***Principles of Pressure & Temperature Control*** *Understanding Pressure Build-up in Process Equipment • Thermal Expansion and Gas Dynamics • Effects of Temperature Variations on Blow Down Performance • Pressure-Temperature Relationship in Hydrocarbon Processes*
1045 - 1130	***Types of Blow Down Systems*** *High-Pressure (HP) and Low-Pressure (LP) Blow Down Systems • Cold Blow Down vs. Hot Blow Down Systems • Manual vs. Automated Blow Down Systems • Blow Down System Variations in Operations*
1130 - 1230	***Components of a Blow Down System*** *Blow Down Valves and Their Types • Flare Header and Flare Stack • Knockout Drums and Liquid Handling Equipment • Control and Instrumentation for Blow Down Operations*
1230 - 1245	*Break*
1245 - 1330	***Regulatory & Industry Standards*** *API 521: Pressure-Relieving and Depressurization Systems • OSHA and Safety Regulations • ISO and ASME Standards for Blow Down Systems • Compliance Requirements in Petroleum Operations*
1330 – 1420	***Case Studies of Blow Down System Failures*** *Learning from Past Industrial Accidents • Case Study: Piper Alpha Disaster • Blow Down System Design Flaws and Their Consequences • Improving System Reliability Through Lessons Learned*
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	***Design Criteria for Blow Down Systems*** *Determining Blow Down Capacity • Considerations for Gas and Liquid Flow in Blow Down Systems • Blow Down System Sizing Methodology • Design Requirements for Blow Down Systems*
0830 – 0930	***Blow Down Valve Selection & Sizing*** *Types of Blow Down Valves (Ball, Gate, Globe, Quick-Opening) • Valve Cv Calculation and Selection Criteria • Actuation Mechanisms (Pneumatic, Hydraulic, Electric) • Redundancy and Fail-Safe Design Considerations*
0930 – 0945	*Break*
0945 – 1100	***Flare System & Knockout Drum Design*** *Role of the Flare System in Blow Down Operations • Knockout Drum Sizing and Liquid Carryover Prevention • Radiation and Dispersion Analysis for Flare Systems • Integration of Blow Down with Flare and Venting Systems*
1100 – 1230	***Blow Down Dynamics & Simulation*** *Process Simulation Tools (HYSYS, Aspen Plus) • Dynamic Blow Down Studies for Emergency Situations • Pressure Transients and Blow Down Time Calculations • Impact of Blow Down on Process Equipment*
1230 – 1245	*Break*
1245 – 1330	***Environmental & Safety Considerations in Blow Down Design*** *Minimizing Flaring and Emissions Control • Noise and Vibration Analysis for Blow Down Systems • Managing Thermal Stresses in Piping and Equipment • Mitigating Risks of Hydrocarbon Releases*
1330 – 1420	***Best Practices in Blow Down System Engineering*** *Guidelines for Best Practices • Common Pitfalls in Blow Down Design • Upgrading Existing Blow Down Systems for Compliance • Integration of Blow Down with Digital Monitoring 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	***Blow Down System Start-Up & Shutdown Procedures*** *Pre-Operational Checks and Readiness Assessment • Blow Down Activation and Step-by-Step Operation • Shutdown Procedures and System Resetting • Operator Responsibilities and Safety Precautions*
0830 – 0930	***Routine Inspection & Preventive Maintenance*** *Maintenance Schedules for Blow Down Valves and Piping • Non-Destructive Testing (NDT) Techniques • Monitoring and Testing of Flare Components • Common Causes of Blow Down System Failures*
0930 – 0945	*Break*
0945 – 1100	***Troubleshooting Common Blow Down System Issues*** *Valve Malfunctions and Leakage Issues • Blockages and Piping Erosion • Incomplete Depressurization and Gas Accumulation • Blow Down System Pressure Fluctuations*
1100 – 1230	***Emergency Blow Down Scenarios & Response*** *Identifying Blow Down System Emergencies • Automatic vs. Manual Blow Down Activation • Emergency Shutdown (ESD) Integration with Blow Down • Drills and Training for Blow Down Emergency Response*

1230 – 1245	*Break*
1245 – 1330	***Digital Monitoring & Control of Blow Down Systems*** *Role of SCADA and DCS in Blow Down Operations • Remote Monitoring and Automated Blow Down Activation • Using IoT and AI for Predictive Maintenance • Digitalization Initiatives in Blow Down Systems*
1330 – 1420	***Safety & Compliance in Blow Down Operations*** *Ensuring Compliance with Global Standards • Incident Reporting and Root Cause Analysis • Safety Culture and Human Factors in Blow Down Operations • Training and Competency Requirements for Operators*
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	***Hazard Identification & Risk Assessment for Blow Down*** *HAZID, HAZOP, and LOPA for Blow Down Systems • Risk-Based Inspection (RBI) for Blow Down Components • Identifying High-Risk Areas in Blow Down Operations • Risk Management Framework for Blow Down*
0830 – 0930	***Blow Down System Safety & Integrity Management*** *Integrity Management Strategies for Blow Down Equipment • Materials Selection for Blow Down Piping and Valves • Corrosion and Erosion Prevention Techniques • Fitness-for-Service (FFS) Assessments*
0930 - 0945	*Break*
0945 - 1100	***Environmental Impact of Blow Down Operations*** *Air Quality and Emissions Control Strategies • Reducing Gas Flaring and VOC Emissions • Noise and Thermal Pollution Management • Environmental Compliance Policies*
1100 - 1230	***Emergency Response & Blow Down System Failures*** *Case Studies of Blow Down Failures and Their Impacts • Developing and Testing Emergency Response Plans • Incident Command System for Blow Down Events • Lessons Learned from Industry Best Practices*
1230 - 1245	*Break*
1245 - 1420	***Legal & Regulatory Compliance in Blow Down Systems*** *Regulatory Framework for Blow Down Operations • Compliance with UAE Environmental and Safety Laws • Global Standards (API, OSHA, ISO) and Their Implications • Reporting Requirements and Legal Consequences of Non-Compliance*
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*

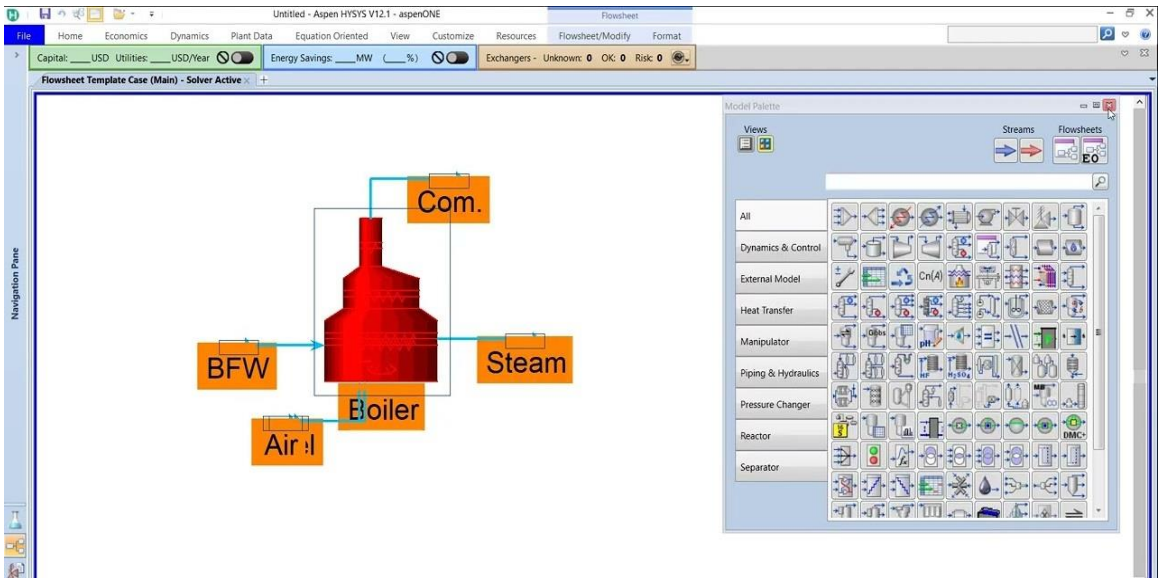
Day 5

0730 – 0930	***Future Trends & Innovations in Blow Down Systems*** *Low-Emission Blow Down Technologies • Advanced Blow Down Valve Designs • Smart Blow Down Systems with AI and Automation • R&D in Sustainable Blow Down Practices*
0930 – 0945	*Break*

0945 – 1100	***Specific Case Studies in Blow Down Systems*** *Successful Blow Down System Implementations • Lessons from Blow Down System Upgrades • Analyzing Blow Down Failures and Improvements • Continuous Improvement Strategies in Blow Down*
1100 – 1230	***Benchmarking Blow Down Systems with Global Standards*** *Comparison with Leading Oil & Gas Companies • Implementing Global Best Practices in Operations • Strategies for Continuous Improvement • Gap Analysis and Performance Enhancement*
1200 - 1215	*Break*
1215 – 1345	***Final Blow Down System Performance Assessment*** *Evaluating Participants' Understanding of Key Concepts • Group Discussions on Best Practices • Role-Playing Exercises for Blow Down Operations • Expectations for Certified Personnel*
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*

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the "ASPEN HYSYS" simulator.



ASPEN HYSYS V12.1 Simulator

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org