COURSE OVERVIEW ME1141-3D
Pressure Vessels

Course Title
Pressure Vessels

Course Reference
ME1141-3D

Course Duration/Credits
Three days/1.8 CEUs/18 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	June 23-25, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	August 10-12, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
3	October 13-15, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	December 14-16, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

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 Pressure Vessels. It covers the design fundamentals of pressure vessels, design codes and standards and material selection for pressure vessels; the wall thickness calculation, head and nozzle design, joint efficiency and weld factors and design under combined loads; the various types of pressure vessels, fabrication processes, welding and weld design and non-destructive testing (NDT) techniques; the hydrostatic testing, pneumatic testing procedures and safety, calculations for test pressure and safety precautions and test reports; and the proper inspection and quality assurance, pressure vessel operation and safety.

During this interactive course, participants will learn the visual and thickness inspections, acoustic emission and AE testing, on-stream inspection techniques and monitoring for corrosion and defects; the common repair methods, hot tapping and in-service repairs including fitness for service (FFS) assessment covering level 1–3 assessment methods, evaluation of flaws and remaining life and repair or replacement decisions; the integrity operating windows (IOWs), risk-based inspection (RBI) planning, asset integrity frameworks and integration with CMMS and digital tools; the regulatory compliance, pressure vessel dossier and records, nameplate and stamping requirements and inspection and re-certification schedules.

Course Objectives

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

- Apply and gain an in-depth knowledge on pressure vessels
- Discuss the design fundamentals of pressure vessels, design codes and standards and material selection for pressure vessels
- Recognize wall thickness calculation, head and nozzle design, joint efficiency and weld factors and design under combined loads
- Identify the various types of pressure vessels and apply fabrication processes, welding and weld design and non-destructive testing (NDT) techniques
- Employ hydrostatic testing, pneumatic testing procedures and safety, calculations for test pressure and safety precautions and test reports
- Apply proper inspection and quality assurance, pressure vessel operation and safety
- Carryout visual and thickness inspections, acoustic emission and AE testing, on-stream inspection techniques and monitoring for corrosion and defects
- Illustrate common repair methods, hot tapping and in-service repairs including fitness for service (FFS) assessment covering level 1–3 assessment methods, evaluation of flaws and remaining life and repair or replacement decisions
- Discuss integrity operating windows (IOWs) and apply risk-based inspection (RBI) planning, asset integrity frameworks and integration with CMMS and digital tools
- Discuss regulatory compliance, pressure vessel dossier and records, nameplate and stamping requirements and inspection and re-certification schedules

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 pressure vessels for mechanical engineers, plant engineers and maintenance personnel, inspection and quality control engineers, project engineers and managers, welding engineers and inspectors, technical staff from EPC contractors and those involved in the design, operation, inspection, and maintenance of pressure vessels across various industries.

Course Fee

US$ $3,750 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:-

- 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.

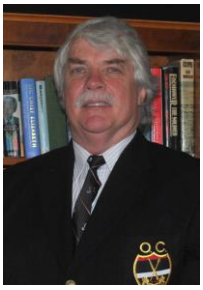
  Haward Technology Middle East will award **1.8 CEUs** (Continuing Education Units) or **18 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation 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. Den Bazley, PE, BSc, is a **Senior Mechanical Engineer** with over **30 years** of industrial experience in **Oil**, **Gas**, **Refinery**, **Petrochemical**, **Power** and **Utilities** industries. His wide expertise includes **Pumps & Compressors** Maintenance & Troubleshooting, **Centrifugal Pump** Design, **Hydraulic Turbines**, Axial Flow **Compressor**, **Centrifugal Pump** Installation & Operation, **Centrifugal Pump** Maintenance & Troubleshooting, **Centrifugal & Positive Displacement Pump** Technology, **Pumps & Valves** Operation, **Bearings**, **Seals & Couplings**, **Compressors & Turbines** Maintenance & Troubleshooting, **Gas Turbine** Design & Maintenance, **Gas Turbine** Troubleshooting, **Pressure Vessel** Design, Fabrication & Testing, **Tank & Tank Farms**, **Heat Exchangers** Operation & Maintenance, **Boilers & Steam System** Management, Re-tubing & Tube Expanding Technology, Propylene **Compressor & Turbine**, **Valve** Installation & Repair, **Safety Relief Valve** Sizing & Troubleshooting, **Dry Gas Seal** Operation, **Mechanical Seal** Installation & Maintenance, Industrial Equipment & **Turbomachinery**, **Pumps**, **Compressors**, **Turbines & Motors**, **Boiler & Steam** System Management, Tune-Up, Heat Recovery & Optimization, **Bearing & Lubrication**, Installation & Failure Analysis, **Boiler** Operation & Maintenance, Process **Control Valves**, **Steam Turbine** Operation, **Bearing** Mounting/Dismounting, **Valve** Types, Troubleshooting & Repair Procedure, **Pressure Vessels & Heat Exchangers**, **Corrosion** Inspection, **PSV** Maintenance & Testing, **Pump** Maintenance, Machinery Troubleshooting, **Valves**, **Safety Relief Valves**, Strainers & Steam Traps, **Pipeline Rules of Thumb**, Analytical Prevention of Mechanical Failure, **Gear Boxes** Troubleshooting & Repair, **Piping & Pipeline** Design & Inspection, **Pigging** & Integrity Assessment, Process Piping Design, **Pipeline** Operation & Maintenance, **Welding & Fabrication**, **Brazing**, Fitness-for-Service (**FFS**), **Process Plant** Equipment, **Pressure Vessels**, Piping & Storage Facilities, Layout of **Piping Systems & Process Equipment**, **Pipe Work** Design & Fabrication, Mechanical Integrity & Reliability, Mechanical **Rotating Equipment & Turbomachinery**, **Motors & Variable Speed Drives**, Mechanical Engineering Design, **Process Plant Shutdown**, Turnaround & Troubleshooting, **Mechanical Alignment**, **Laser & Dial-Indicator** Techniques, **Material Cataloguing**, **Condition Based** Monitoring, **Maintenance** Management, **Reliability** Management, Reliability Centred Maintenance (**RCM**), Total Plant Maintenance (**TPM**) and Reliability-Availability-Maintainability (**RAM**), **Engineering Drawings, Codes & Standards**, **P&ID Reading, Interpretation & Developing**, **Maintenance & Reliability** Best Practices, **Maintenance** Auditing, **Benchmarking & Performance** Improvement, Excellence in **Maintenance & Reliability** Management, **Preventive & Predictive** Maintenance & Machinery Failure Analysis (**RCFA**), Total Plant Reliability Centered Maintenance (**RCM**), Rotating Equipment Reliability Optimization, Machinery Failure Analysis, Prevention & Troubleshooting, **Maintenance** Planning, Scheduling & Work Control and **Maintenance Planning & Cost** Estimation.

During his career life, Mr. Bazley has gained his practical and field experience through his various significant positions and dedication as the **General Manager**, **Branch Manager**, **Refinery Chairman**, **Engineering Manager**, **Maintenance Engineer**, **Construction Engineer**, **Project Engineer**, **Mechanical Engineer**, **Associate Engineer**, **Oil Process Engineer**, **Mechanical Services Superintendent**, **Quality Coordinator**, **Planning Coordinator**, **Consultant/Instructor**, **Lecturer/Trainer** and **Public Relations Officer** for numerous international companies like **ESSO**, **FFS Refinery**, Dorbyl Heavy Engineering (**VECOR**), Vandenbergh Foods (**Unilever**), **Engen Petroleum**, Royle Trust and **Pepsi-Cola**.

Mr. Bazley is a **Registered Professional Engineer** and has a **Bachelor** degree in **Mechanical Engineering**. Further, he is a **Certified Engineer** (Government Certificate of Competency GCC Mechanical Pretoria), a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management** (**ILM**), an active member of the **Institute of Mechanical Engineers** (**IMechE**) and has delivered numerous trainings, courses, seminars and workshops 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	***Introduction to Pressure Vessels*** *Definition & Types (Storage, Reactors, Separators) • Common Materials Used • Applications Across Industries • Overview of International Codes & Standards (ASME, PED)*
0930 – 0945	*Break*
0945 – 1030	***Design Fundamentals*** *Pressure Vessel Configurations & Shapes • Design Criteria & Allowable Stresses • Internal & External Pressure Considerations • Corrosion Allowance & Safety Factors*
1030 – 1130	***Design Codes & Standards*** *ASME Section VIII Div 1 & 2 Overview • EN 13445 & PED Basics • API Standards Applicable to Vessels • Compliance & Certification Process*
1130 – 1230	***Material Selection for Pressure Vessels*** *Mechanical Properties (Yield Strength, Toughness) • Temperature & Pressure Constraints • Weldability & Corrosion Resistance • Impact of Material Selection on Lifecycle*
1230 – 1245	*Break*
1245 – 1330	***Design Calculations*** *Wall Thickness Calculation (Cylindrical/Spherical) • Head & Nozzle Design • Joint Efficiency & Weld Factors • Design Under Combined Loads (Pressure + Thermal + Seismic)*
1330 – 1420	***Types of Pressure Vessels*** *Horizontal versus Vertical Vessels • Jacketed, Vacuum, & Lined Vessels • Multi-Compartment & Divided Vessels • Special Design Considerations (Cryogenic, High Temp)*
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	***Fabrication Processes*** *Plate Cutting & Rolling • Welding Methods (SMAW, GTAW, SAW) • Post-Weld Heat Treatment (PWHT) • Dimensional Tolerances & Control*
0830 – 0930	***Welding & Weld Design*** *Types of Weld Joints in Vessels • Selection of Weld Procedures (WPS) • Qualification of Welders & Procedures • Common Weld Defects & Prevention*
0930 – 0945	*Break*
0945 – 1045	***Non-Destructive Testing (NDT) Techniques*** *Visual Testing (VT) & Dye Penetrant (PT) • Ultrasonic Testing (UT) & Radiographic Testing (RT) • Magnetic Particle Testing (MT) • NDT Acceptance Criteria per ASME*
1045 – 1200	***Hydrostatic & Pneumatic Testing*** *Purpose & Setup of Hydrostatic Test • Pneumatic Testing Procedures & Safety • Calculations for Test Pressure • Safety Precautions & Test Reports*
1200 – 1215	*Break*
1215 – 1330	***Inspection & Quality Assurance*** *Inspection Hold Points • Third-Party Inspections & Certifications • Documentation & Traceability (MTR, ITP) • Quality Control Checklists*
1330 – 1420	***Failure Modes & Case Studies*** *Types of Failure (Brittle Fracture, Creep, Fatigue) • Corrosion & Erosion Issues • Real-World Failure Examples • Lessons Learned & Best Practices*
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*

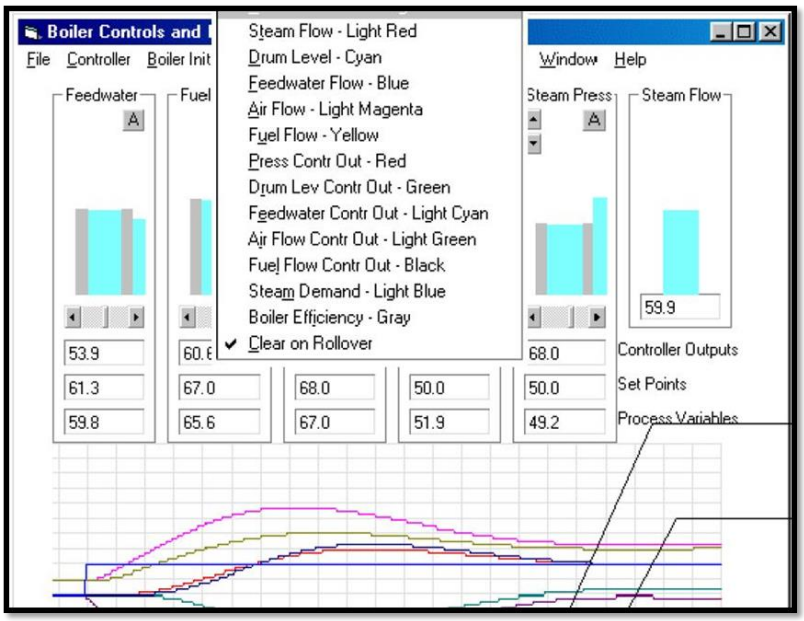
Day 3

0730 – 0830	***Pressure Vessel Operation & Safety*** *Safe Operating Limits & Controls • Relief Valves & Safety Devices • Start-Up & Shutdown Procedures • Operator Responsibilities & Training*
0830 – 0930	***In-Service Inspection & Monitoring*** *Visual & Thickness Inspections • Acoustic Emission & AE Testing • On-Stream Inspection Techniques • Monitoring for Corrosion & Defects*
0930 - 0945	*Break*
0945 – 1030	***Maintenance & Repair Techniques*** *Common Repair Methods (Weld Overlays, Patch Plates) • Hot Tapping & In-Service Repairs • Documentation & Re-Certification • Risk-Based Maintenance Planning*
1030 – 1115	***Fitness for Service (FFS) Assessment*** *API 579/ASME FFS-1 Introduction • Level 1–3 Assessment Methods • Evaluation of Flaws & Remaining Life • Repair or Replacement Decisions*
1115 - 1200	***Pressure Vessel Integrity Management*** *Integrity Operating Windows (IOWs) • Risk-Based Inspection (RBI) Planning • Asset Integrity Frameworks • Integration with CMMS & Digital Tools*
1200 - 1215	*Break*

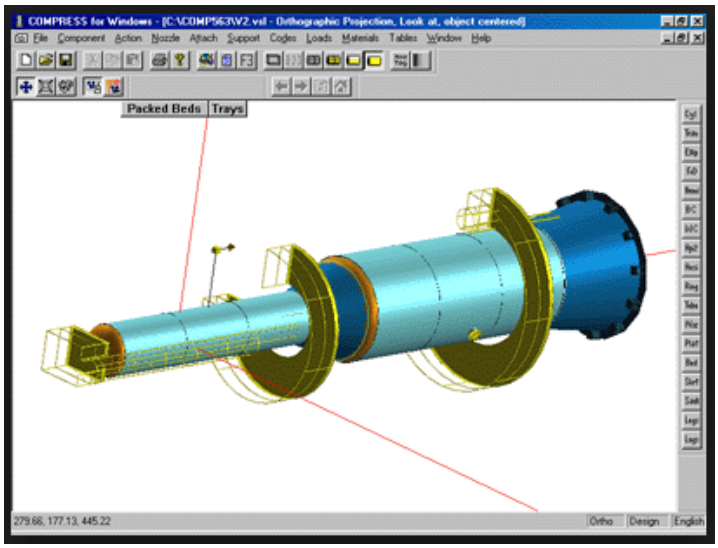
1215 – 1345	***Regulations, Documentation, & Certification*** *Regulatory Compliance (OSHA, Local Authority) • Pressure Vessel Dossier & Records • Nameplate & Stamping Requirements • Inspection & Re-Certification Schedules*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) 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 session 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 simulator "Win Boiler Sim" and "COMPRESS".



Win Boiler Sim



COMPRESS Simulator

Course Coordinator

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