



COURSE OVERVIEW ME0138
Application of Standards in Boiler, Pressure Vessel & Piping Systems

Course Title

Application of Standards in Boiler, Pressure Vessel & Piping Systems

Course Date/Venue

Please refer to page 5

Course Reference

ME0138

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 Application of Standards in Boiler, Pressure Vessel & Piping Systems. It covers the ASME boiler and Pressure Vessel Code (BPVC), ASME B31 piping codes, API, ISO, EN standards and regulatory requirements and compliance; the ASME BPVC sections, ASME B31 piping standards, design codes versus in-service codes and key terminologies and definitions; the design basis for pressure equipment, pressure vessel design: ASME section VIII division 1, design of piping systems: ASME B31.3, power boiler design: ASME section I, design data and material properties: ASME section II and design software and tools.



Further, the course will also discuss the material selection and code compliance, fabrication practices for vessels and boilers and piping fabrication and assembly; the ASME section IX – welding qualifications, welding and brazing requirements, corrosion protection and coating and nondestructive examination (NDE) techniques; the hydrostatic and pneumatic testing; the API 510 and 570 inspection codes, weld defects and acceptance criteria, fitness-for-service (API 579); and the integrity management programs.



During this interactive course, participants will learn the types of pressure relief devices and sizing methods for relief valves; the boiler operation and safety requirements and piping support design and vibration control; the documentation, certification and quality assurance; and the common noncompliance and failure case studies.

Course Objectives

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

- Apply and gain an in-depth knowledge on the application of standards in boiler, pressure vessel and piping systems
- Discuss ASME boiler and pressure vessel code (BPVC), ASME B31 piping codes, API, ISO, EN standards and the regulatory requirements and compliance
- Explain ASME BPVC sections, ASME B31 piping standards, design codes versus in-service codes and key terminologies and definitions
- Illustrate design basis for pressure equipment, pressure vessel design: ASME section VIII division 1, design of piping systems: ASME B31.3, power boiler design: ASME section I, design data and material properties: ASME section II and the design software and tools
- Carryout material selection and code compliance, fabrication practices for vessels and boilers and piping fabrication and assembly
- Identify the ASME section IX – welding qualifications, welding and brazing requirements, corrosion protection and coating and nondestructive examination (NDE) techniques
- Perform hydrostatic and pneumatic testing and discuss API 510 and 570 inspection codes, weld defects and acceptance criteria, fitness-for-service (API 579) and integrity management programs
- Identify the types of pressure relief devices and the sizing methods for relief valves
- Review boiler operation and safety requirements and piping support design and vibration control
- Discuss the documentation, certification and quality assurance as well as common noncompliance and failure case studies

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 on the design, fabrication, inspection and repair of oil and gas pipeline code in accordance with the international standard ASME B31.4-B31.8 for those who are involved in engineering or technical aspects of pipelines, including designers, engineers, engineering managers, construction supervisors, operations supervisors, inspectors, code compliance managers, asset integrity managers, pipeline safety regulators, consultants and other technical staff. Further, the course is also suitable for those new to pipelines, as well as providing a good refresher for experienced personnel.

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

Haward’s 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**. Haward’s certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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. Karl Thanasis, PEng, MSc, MBA, BSc, is **Senior Mechanical & Maintenance Engineer** with over **30 years** of extensive industrial experience. His wide expertise includes **Piping & Pipeline, Maintenance, Repair, Shutdown, Turnaround & Outages, Maintenance & Reliability Management, Mechanical Maintenance Planning, Scheduling & Work Control, Advanced Techniques in Maintenance Management, Predictive & Preventive Maintenance, Maintenance & Operation Cost Reduction** Techniques, Reliability

Centered Maintenance (RCM), **Machinery Failure Analysis, Rotating Equipment Reliability Optimization & Continuous Improvement, Material Cataloguing, Mechanical & Rotating Equipment Troubleshooting & Maintenance, Root Cause Analysis & Reliability Improvement, Condition Monitoring, Root Cause Failure Analysis (RCFA), Steam Generation, Steam Turbines, Power Generator Plants, Gas Turbines, Combined Cycle Plants, Boilers, Process Fired Heaters, Air Preheaters, Induced Draft Fans, All Heaters Piping Work, Refractory Casting, Heater Fabrication, Thermal & Fired Heater Design, Heat Exchangers, Heat Transfer, Coolers, Power Plant Performance, Efficiency & Optimization, Storage Tank Design & Fabrication, Thermal Power Plant Management, Boiler & Steam System Management, Pump Operation & Maintenance, Chiller & Chiller Plant Design & Installation, Pressure Vessel, Safety Relief Valve Sizing & Selection, Valve Disassembling & Repair, Pressure Relief Devices (PSV), Hydraulic & Pneumatic Maintenance, Advanced Valve Technology, Pressure Vessel Design & Fabrication, Pumps, Turbo-Generator, Turbine Shaft Alignment, Lubrication, Mechanical Seals, Packing, Blowers, Bearing Installation, Couplings, Clutches and Gears.** Further, he is also versed in **Wastewater Treatment Technology, Networking System, Water Network Design, Industrial Water Treatment in Refineries & Petrochemical Plants, Piping System, Water Movement, Water Filtering, Mud Pumping, Sludge Treatment and Drying, Aerobic Process of Water Treatment** that includes **Aeration, Sedimentation and Chlorination Tanks.** His strong background also includes **Design and Sizing of all Waste Water Treatment Plant Associated Equipment** such as **Sludge Pumps, Filters, Metering Pumps, Aerators and Sludge Decanters.**

Mr. Thanasis has acquired his thorough and practical experience as the **Project Manager, Plant Manager, Area Manager - Equipment Construction, Construction Superintendent, Project Engineer and Design Engineer.** His duties covered **Plant Preliminary Design, Plant Operation, Write-up of Capital Proposal, Investment Approval, Bid Evaluation, Technical Contract Write-up, Construction and Sub-contractor Follow up, Lab Analysis, Sludge Drying and Management of Sludge Odor and Removal.** He has worked in various companies worldwide in the **USA, Germany, England and Greece.**

Mr. Thanasis is a **Registered Professional Engineer** in the **USA and Greece** and has a **Master and Bachelor** degrees in **Mechanical Engineering with Honours** from the **Purdue University and SIU in USA** respectively as well as an **MBA** from the **University of Phoenix in USA.** Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, seminars, workshops and conferences worldwide.



Course Date/Venue

Session(s)	Date	Venue
1	April 26-30, 2026	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA
2	June 07-11, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
3	June 08-12, 2026	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain
4	July 12-16, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
5	September 21-25, 2026	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
6	November 22-26, 2026	Meeting Plus 9, City Centre Rotana, Doha, Qatar
7	December 27-31, 2026	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
8	January 10-14, 2027	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
9	February 08-12, 2027	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
10	March 14-18, 2027	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain

Course Fee

Doha	US\$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Al Khobar	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.
Dubai	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.
Cairo	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.
London	US\$ 8,800 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Seville	US\$ 8,800 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.





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.

Accommodation

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

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 Pressure Equipment Standards ASME Boiler & Pressure Vessel Code (BPVC) • ASME B31 Piping Codes Overview (B31.1, B31.3, B31.8) • API, ISO, EN Standards Introduction • Comparison of International Standards and Jurisdictional Requirements
0930 – 0945	Break
0945 – 1045	Regulatory Requirements & Compliance Role of National Boards and Local Authorities • Code Stamping, Registration and Certification • Role of Notified Bodies and Authorized Inspectors • Regulatory Frameworks: PED, OSHA, IBR
1045 – 1145	Introduction to ASME BPVC Sections Section I – Power Boilers • Section II – Materials (Parts A–D) • Section VIII – Pressure Vessels (Divisions 1, 2, 3) • Section IX – Welding & Brazing Qualifications
1145 – 1230	Introduction to ASME B31 Piping Standards B31.1 – Power Piping • B31.3 – Process Piping • B31.5 – Refrigeration Piping • B31.8 – Gas Transmission and Distribution
1230 – 1245	Break





1245 – 1345	Design Codes versus In-Service Codes Difference Between Design/Fabrication and Maintenance/Repair Codes • Overview of NBIC and API 510/570 • Fitness-for-Service Concepts (API 579) • Remaining Life Assessments
1345 – 1420	Key Terminologies & Definitions Pressure Boundary, MAWP, MDMT • Corrosion Allowance, Hydrotest Pressure • Design Pressure versus Operating Pressure • Design Factor and Safety Factor
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 Basis for Pressure Equipment Design Inputs: Pressure, Temperature, Fluid Properties • Loadings: Internal Pressure, External Pressure, Wind, Seismic • Design Life, Fatigue and Cyclic Loads • Allowable Stress Determination
0830 – 0930	Pressure Vessel Design: ASME Section VIII Division 1 Cylindrical and Spherical Vessel Design Equations • Head Types: Hemispherical, Ellipsoidal, Torispherical • Nozzle Reinforcement and Branch Connections • UG-27, UG-37, UG-45 Applications
0930 – 0945	Break
0945 – 1100	Design of Piping Systems: ASME B31.3 Wall Thickness Calculations • Bends, Reducers, Tees and Branch Reinforcement • Flexibility and Expansion Stress Considerations • Sustained versus Occasional Loads
1100 – 1230	Power Boiler Design: ASME Section I Drum Design Rules • Safety Valve Sizing and Rules for Overpressure Protection • Heat Recovery Steam Generators (HRSG) • Design Requirements for Economizers and Superheaters
1230 – 1245	Break
1245 – 1330	Design Data & Material Properties: ASME Section II Allowable Stress Values from Section II, Part D • Material Selection and Grades (A106, SA516, etc.) • Temperature-Dependent Stresses • Impact Test Exemptions and Requirements
1330 – 1420	Design Software & Tools PVELite, COMPRESS for Pressure Vessel Design • CAESAR II for Piping Stress Analysis • Finite Element Analysis (FEA) Overview • Spreadsheet-Based Calculations
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	Material Selection & Code Compliance Material Specifications from ASME Section II • ASTM versus ASME Equivalence • Impact Testing (Charpy V-Notch) and MDMT Considerations • Traceability and MTR Requirements
0830 – 0930	Fabrication Practices for Vessels & Boilers Forming Methods: Rolling, Spinning, Pressing • Weld Preparations and Joint Types • Fit-Up, Tolerances and Dimensional Inspections • Use of PWHT and Dimensional Control
0930 – 0945	Break
0945 – 1100	Piping Fabrication & Assembly Pipe Cutting, Beveling and Fitting Techniques • Gasket Selection and Flange Assembly • Hydrostatic versus Pneumatic Testing • Hot Tapping and In-Service Welding
1100 – 1230	ASME Section IX – Welding Qualifications Procedure Qualification Records (PQR) • Welder Performance Qualification (WPQ) • Essential and Non-Essential Variables • Welding Process Types and Applications
1230 – 1245	Break
1245 – 1330	Welding & Brazing Requirements SMAW, GTAW, GMAW Applications in Boilers/Piping • Brazing Standards and Procedures • Weld Repairs and Defect Acceptance Criteria • Impact of Welding on Material Properties
1330 – 1420	Corrosion Protection & Coating Corrosion Allowances in Design • Internal/External Coating Systems • Cathodic Protection Basics • Inspection of Coatings and Linings
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	Nondestructive Examination (NDE) Techniques Visual, PT, MT, UT, RT Applications • Acceptance Criteria from ASME V & VIII • Advantages and Limitations of Each Method • Inspector Qualifications and Standards
0830 – 0930	Hydrostatic & Pneumatic Testing Test Pressure Calculations • Procedures and Safety Precautions • Leakage versus Strength Tests • Code Requirements for Duration and Documentation
0930 – 0945	Break
0945 – 1100	API 510 & 570 Inspection Codes In-Service Inspection of Pressure Vessels and Piping • Inspection Intervals and RBI Programs • Thickness Monitoring and Corrosion Rate Calculations • Repair and Rerating Procedures
1100 – 1230	Weld Defects & Acceptance Criteria Common Weld Defects: Porosity, Undercut, Lack of Fusion • Code-Based Criteria for Acceptance/Rejection • Rework and Repair Methodologies • Documentation and Weld Tracking
1230 – 1245	Break





1245 – 1330	Fitness-for-Service (API 579) Overview Assessment Levels 1 to 3 • Local and General Metal Loss Evaluation • Crack-Like Flaw Assessment • Remaining Life and Inspection Planning
1330 – 1420	Integrity Management Programs Risk-Based Inspection (RBI) Principles • Data Management and Condition Monitoring • KPIs for Mechanical Integrity • Failure Modes and Effects Analysis (FMEA)
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

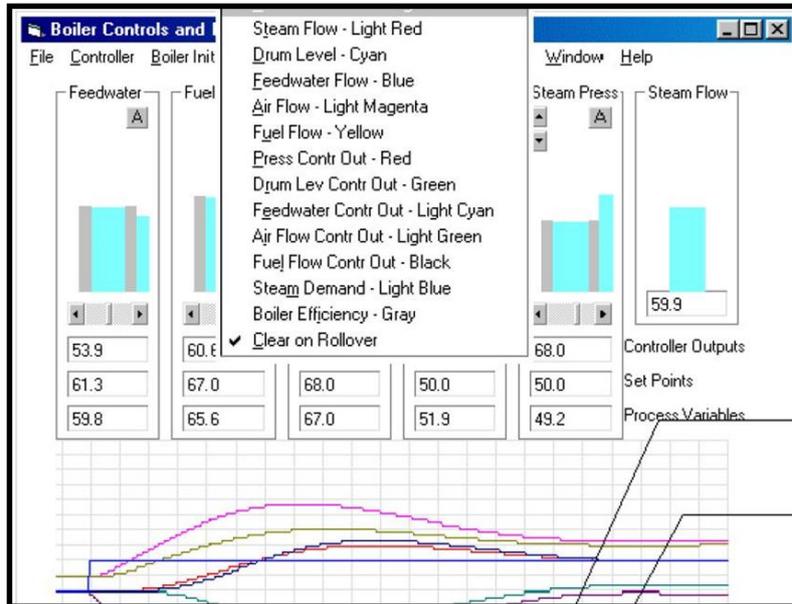
Day 5

0730 – 0830	Relief Systems & Overpressure Protection Types of Pressure Relief Devices (PRVs, Rupture Disks) • Sizing Methods for Relief Valves • API 520, 521, 526, 2000 Overview • Installation and Maintenance Best Practices
0830 – 0930	Boiler Operation & Safety Requirements Operating Parameters Monitoring • Feedwater Systems and Control Devices • Blowdown and Shutdown Procedures • Boiler Explosion Case Studies
0930 – 0945	Break
0945 – 1100	Piping Support Design & Vibration Control Types of Supports: Rigid, Spring, Snubbers • Expansion Loops and Anchor Points • Thermal Growth Considerations • Vibration Sources and Mitigation
1100 – 1230	Documentation, Certification & Quality Assurance Manufacturer's Data Report (U-1, P-1, etc.) • Quality Control (QC) Manual Elements • Welding Records, NDE Logs, Inspection Reports • Turnover Dossiers and Handover Packages
1230 – 1245	Break
1245 – 1345	Common Noncompliance & Failure Case Studies Pressure Vessel Rupture Due to Design Error • Piping Failure Due to Support Misplacement • Boiler Explosion from Overpressure • Lessons Learned and Root Cause Analyses
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

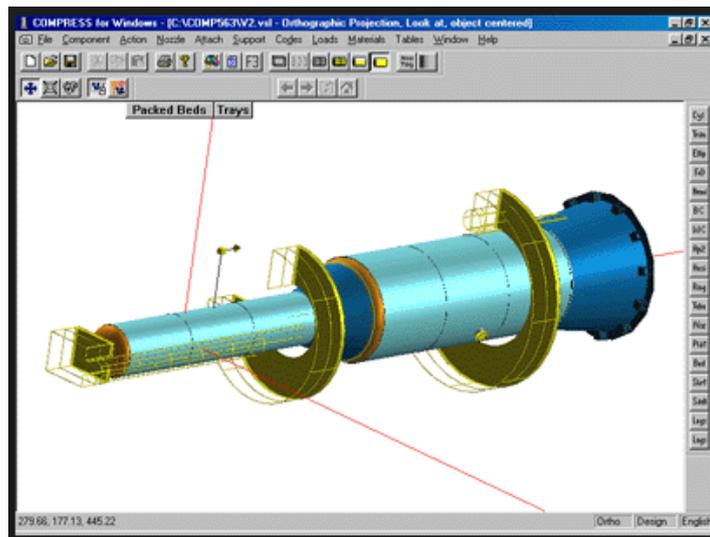


Simulator (Hands-on Practical Sessions)

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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