COURSE OVERVIEW ME0045
ASME VIII Pressure Vessel Design, Fabrication & Testing (Division 1)

Course Title
ASME VIII Pressure Vessel Design, Fabrication & Testing (Division 1)

Course Date/Venue
Session 1: March 14-18, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar
Session 2: August 29-September 02, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Reference
ME0045

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 ASME Boiler and Pressure Vessel Code Section 8.D.1. It covers the development and significance of ASME BPVC code; the ASME BPVC Section VIII Divisions 1, 2, and 3; the scope and applicability of Division 1; the basic design principles covering materials, design stress and factors of safety; the types of pressure vessels; the categories, configurations and their specific considerations; the material specifications, allowable stress values and sourcing of pressure vessel; and the shells under internal pressure, heads and formed sections and opening and reinforcements around nozzles, manways and other penetrations.

Further, the course will also discuss the welding considerations, processes, joint efficiencies and material compatibility; the effects of vacuum and external loads and their design implications; the post-weld heat treatment, stress relieving and other necessary procedures; the examination and inspection techniques covering radiography, ultrasonic testing and other non-destructive tests; the pressure testing procedures, certification and stamping, and the compilation of proper documentation and manufacturer's data reports.

During this interactive course, participants will learn the welding documentation and qualifications; the special service requirements, considerations of external loads and usage of appendices in Division 1; the bolting, gasket selection and design as per ASME standards; the popular software tools and their applicability; comparing Division 2 and 3 and their differences in design rules, materials and inspection requirements; keep updated with the latest code revisions; the pressure vessel repairs and alterations within the ASME standards; integrating with other ASME sections.

Course Objectives/Outcomes & Benefits for the Participants

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

- Apply and gain an in-depth knowledge on ASME boiler and pressure vessel code Section 8.D.1
- Discuss the development and significance of ASME BPVC code as well as the ASME BPVC Section VIII Divisions 1, 2, and 3
- Explain the scope and applicability of Division 1 including the basic design principles covering materials, design stress and factors of safety
- Identify the types of pressure vessels as well as the categories, configurations and their specific considerations
- Recognize the material specifications, allowable stress values and sourcing of pressure vessel
- Design shells under internal pressure, heads and formed sections and opening and reinforcements around nozzles, manways and other penetrations
- Apply welding considerations, processes, joint efficiencies and material compatibility
- Recognize the effects of vacuum and external loads and their design implications
- Employ post-weld heat treatment, stress relieving and other necessary procedures
- Implement examination and inspection techniques covering radiography, ultrasonic testing and other non-destructive tests
- Apply pressure testing procedures, certification and stamping and compilation of proper documentation and manufacturer's data reports
- Review welding documentation and qualifications and identify special service requirements, considerations of external loads and usage of appendices in Division
- Discuss bolting, gasket selection and design as per ASME standards and identify the popular software tools and their applicability
- Compare Division 2 and 3 and their differences in design rules, materials and inspection requirements
- Keep updated with the latest code revisions, carryout pressure vessel repairs and alterations within the ASME Standards and integrate with other ASME sections

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 ASME VIII pressure vessel for those who are involved in the design, fabrication and testing of pressure vessels and for engineers who want to know more or move to this very interesting engineering area. Further, engineers involved in maintenance, repair and flaw evaluation of pressure vessels will also have a need for this course.

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:

- 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

This course will be conducted by the following instructor. However, we have the right to change the course instructor prior to the course date and inform participants accordingly:

Mr. Luis Manuel is a **Senior Marine Offshore Engineer** with over **30 years** of extensive and practical experience within the **Oil**, **Gas**, **Petrochemical** and **Petroleum** industries. His expertise includes **Pipelines** & **Piping** Design, **International Ship and Port Facility Security Code** (**ISPS**) **Code**, Inspection & Maintenance (**ASME B31**, **API 579** & **API 580**), **Offshore Structure** Engineering, Risk-Based Inspection (**RBI**), Integrity Assessment, Forensic Analysis, Structural Analysis, Design & Engineering, Naval Architecture, Regulatory Compliance Inspections, **Stress & Fatigue Analysis** using **SACS**, **StruCad**, **Caesar II** and **Finite Element Analysis** simulators. He was the **Technical Advisor** and **Engineering Manager** of a leading international engineering firm where he led all Inspections, Structural Engineering and Pipeline Projects for **Total-ELF**, **Shell** and **Mobil**.

During his career life, Mr. Manuel has gained his thorough practical experience in **multiple engineering disciplines** that includes pipeline/piping inspection and engineering, naval engineering, container cargo lashing, aerospace engineering and offshore structural engineering (oil and gas exploration platforms) through several challenging positions such as the **Senior Pipelines Engineer**, **Senior Piping Engineer**, **Senior & Lead Structural Engineer**, **Staff Engineer**, **Naval Architect** and **Applications Engineer** for various international companies including **Chevron**, **ExxonMobil**, **Addax Petroleum**, **ZAGOC**, **NASSCO**, DWC, Point Engineering, **US ARMY**, W.S. & Atkins, Atlas Engineering, **Heerema Offshore**, Casbarian Engineering Associates (CEA), Textron Marine, Ingalls Shipbuilding and Peck & Hale. Further, he has been heavily involved in the development of fabrication and erection drawings for offshore structures including installation and rigging as well as in the instruction materials as authorized by EDI (**Engineering Dynamic Incorporated**) for the training of engineers on the Structural Analysis Computer System (**SACS**) software.

Mr. Manuel has a **Bachelor** degree in **Structural & Marine Engineering** from the **State University of New York**. Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**), a **Certified Instructor/Trainer** and the **author** of the book "**Offshore Platforms Design**" and the "**SACS Software Training Module**".

Accommodation

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

Course Fee

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.

Training Methodology

Our courses employ an interactive, learner-centred methodology that integrates theoretical knowledge with practical application. The training is delivered through a suitable combination of some or all of the following methods, selected according to the course content and learning objectives:

- Instructor-led presentations and facilitated discussions
- Practical workshops and participant presentations
- Hands-on exercises and real-world case studies
- Equipment demonstrations and technical drawings
- Hardware- and software-based simulations
- Gamification & Role Play in soft-skills courses only
- Virtual Reality (VR) and Augmented Reality (AR)
- Instructional videos and other relevant training resources

This blended approach encourages active participation, strengthens practical skills and supports the effective application of acquired knowledge in the workplace.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

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	***Course Introduction & Objectives*** *Overview, Goals & Expected Outcomes*
0930 – 0945	*Break*
0945 – 1030	***History & Evolution of the ASME BPVC*** *The Need, Development & Significance of The Code*
1030 – 1130	***Overview of ASME BPVC Section VIII*** *Introduction to Divisions 1, 2 & 3*
1130 – 1215	***Scope & Applicability of Division 1*** *Defining the Boundaries of D.1 – which Vessels it Covers & Doesn't*
1215 – 1230	*Break*
1230 – 1330	***Basic Design Principles*** *Materials, Design Stress & Factors of Safety*
1330 – 1400	***Types of Pressure Vessels Covered*** *Categories, Configurations & their Specific Considerations*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Materials for Pressure Vessels*** *Material Specifications, Allowable Stress Values & Sourcing*
0830 – 0930	***Design of Shells Under Internal Pressure*** *Calculations, Thickness Determinations & Joint Efficiencies*
0930 – 0945	*Break*
0945 – 1100	***Design of Heads & Formed Sections*** *Types of Heads, their Design Parameters & Considerations*
1100 – 1215	***Opening & Reinforcements*** *Design around Nozzles, Manways & Other Penetrations*
1215 – 1230	*Break*
1230 – 1300	***Welding Considerations*** *Welding Processes, Joint Efficiencies & Material Compatibility*
1300 - 1420	***External Pressure Design & Considerations*** *Effects of Vacuum & External Loads & their Design Implications*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Heat Treatment Requirements*** *Post-Weld Heat Treatment, Stress Relieving & Other Necessary Procedures*
0830 – 0930	***Examination & Inspection Techniques*** *Radiography, Ultrasonic Testing & Other Non-Destructive Tests*
0930 – 0945	*Break*
0945 – 1100	***Pressure Testing Procedures*** *Hydrostatic & Pneumatic Tests, Their Safety Protocols & Execution*
1100 – 1215	***Certification & Stamping*** *U-Stamp, R-Stamp & Other Applicable Certifications*
1215 – 1230	*Break*
1230 – 1300	***Documentation & Manufacturer's Data Reports*** *Importance & Compilation of Proper Documentation*
1300 - 1420	***Welding Documentation & Qualifications*** *WPS, PQR & Welder Qualifications as per ASME Standards*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Special Service Requirements*** *Considerations for Vessels in Cyclic or Hazardous Services*
0830 – 0930	***Considerations for External Loads*** *Effects of Wind, Seismic Activity & Other External Forces*
0930 – 0945	*Break*
0945 – 1100	***Use of Appendices in Division 1*** *Importance, Interpretations & Specific Cases*
1100 – 1215	***Flange & Gasket Design*** *Bolting, Gasket Selection & Design as per ASME Standards*

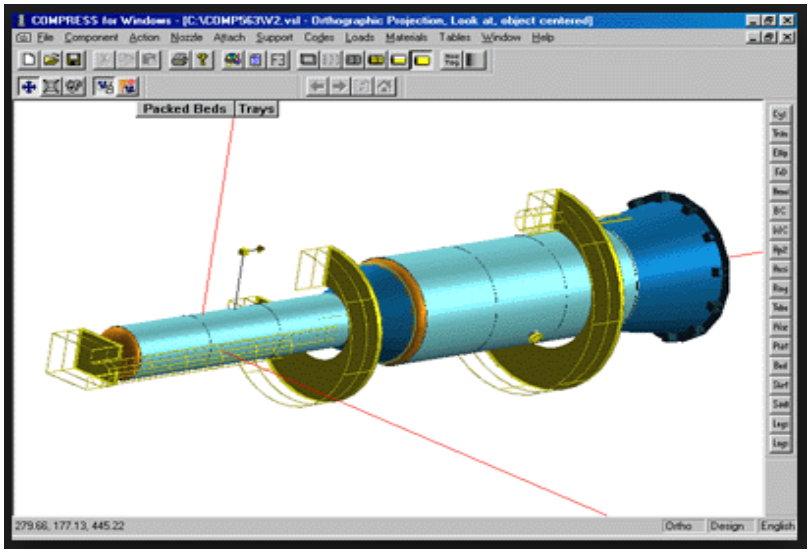
1215 – 1230	*Break*
1230 – 1300	***Use of Software in Design & Analysis*** *Popular Software Tools & their Applicability*
1300 - 1420	***Case Study: Pressure Vessel Failure Analysis*** *Real-World Failure Cases, Lessons Learned & the Role of ASME Standards*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0830 - 0930	***Comparison with Division 2 & 3*** *Differences in Design Rules, Materials & Inspection Requirements*
0930 – 0945	*Break*
0945 – 1130	***Recent Updates & Amendments*** *Staying Updated with the Latest Code Revisions*
1130 – 1230	***Pressure Vessel Repairs & Alterations*** *How Repairs are Addressed within the ASME Standards*
1230 – 1245	*Break*
1245 – 1345	***Integration with Other ASME Sections*** *Relation with other Sections Like Piping, B31 Codes, etc.*
1345 – 1400	***Course Conclusion***
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 state-of-the-art "COMPRESS" simulator.



COMPRESS Simulator

Course Coordinator

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