COURSE OVERVIEW FE0429
ASME Section IX, Welding and Brazing

Course Title
ASME Section IX, Welding and Brazing

Course Date/Venue
December 14-18, 2025/Abu Dhabi Meeting Room, The Tower Plaza Hotel, Dubai, UAE

Course Reference
FE0429

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.

The course is designed to provide participants with a comprehensive overview of ASME Section IX: Welding Procedure Specifications (WPS), Procedure Qualification Records (PQR) & Welder Performance Qualification (WPQ). It covers the ASME boiler and pressure vessel code, scope and application of Section IX and key definitions and terminologies; the code organization and interpretation, responsibilities of fabricators and inspectors and welding processes in Section IX; and the procedure qualification record (PQR) requirements, essential variables for PQR, supplementary essential variables (toughness) and nonessential variables and their flexibility.

Further, the course will also discuss the test coupons and test positions covering dimensions and preparation, grove, fillet, and overlay coupons, welding positions and role of ASME Section IX figures; the testing methods and acceptance criteria, writing and reviewing a welding procedure specification (WPS) and essential variables for WPS (by process); the range of qualification covering thickness ranges for base and weld metal, diameter limits for pipes, multiple processes and joint types and qualification for production use; supporting multiple WPS with one PQR; the variables for prequalified WPS (code cases) and welder/welding operator qualification; and the essential variables for welder qualification.

During this interactive course, participants will learn the WPQ test methods and acceptance criteria covering visual inspection, bend test, radiographic and ultrasonic examination and fillet weld break, macro-etch, discontinuity limits and defect rejection; the WPQ recordkeeping and certification, multiple process qualifications and performance qualification exercises; the brazing and other special processes and nonconformities and common errors in Section IX; the auditing and compliance verification covering internal and external audit expectations, checklist for code compliance, handling NCRS and observations and roles of QA/QC during ASME audits; and the Section I pressure part qualification, Section VIII vessel manufacturing considerations, Section B31.3 piping system welding and harmonization and cross-reference of variables.

Course Objectives

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

- Apply and gain an in-depth knowledge on welding procedure specifications (WPS), procedure qualification records (PQR) and welder performance qualification (WPQ) in accordance with ASME IX
- Discuss ASME boiler and pressure vessel code, scope and application of Section IX and key definitions and terminologies
- Recognize code organization and interpretation, responsibilities of fabricators and inspectors and welding processes in Section IX
- Identify procedure qualification record (PQR) requirements, essential variables for PQR, supplementary essential variables (toughness) and nonessential variables and their flexibility
- Describe test coupons and test positions covering dimensions and preparation, grove, fillet, and overlay coupons, welding positions and role of ASME Section IX figures
- Apply testing methods and acceptance criteria, write and review welding procedure specification (WPS) and identify essential variables for WPS (by process)
- Discuss the range of qualification covering thickness ranges for base and weld metal, diameter limits for pipes, multiple processes and joint types and qualification for production use
- Support multiple WPS with one PQR and recognize variables for prequalified WPS (code cases)
- Review welder/welding operator qualification and essential variables for welder qualification
- Employ WPQ test methods and acceptance criteria covering visual inspection, bend test, radiographic and ultrasonic examination and fillet weld break and macro-etch and discuss discontinuity limits and defect rejection
- Apply WPQ recordkeeping and certification, multiple process qualifications and performance qualification exercises
- Implement brazing and other special processes and identify nonconformities and common errors in Section IX

- Carryout auditing and compliance verification covering internal and external audit expectations, checklist for code compliance, handling NCRS and observations and roles of QA/QC during ASME audits
- Discuss Section I pressure part qualification, Section VIII vessel manufacturing considerations, Section B31.3 piping system welding and harmonization and cross-reference of variables

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 welding procedure specifications (WPS), procedure qualification records (PQR) and welder performance qualification (WPQ) in accordance with ASME IX for welding engineers, inspection engineers, facility integrity engineers, fabrication engineers, mechanical engineers, NDT personnel, quality assurance personnel, testing laboratory personnel, and maintenance personnel. Further, this course is a must for those who are involved in inspection of welding construction, qualifying welders, brazers and operators or involved in writing and qualifying welding and brazing procedure specifications, reviewing supplier procedures, auditing or reviewing in-house procedures and qualifications and those who estimate jobs in compliance of ASME code.

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. George Poulos, MBA, MSc, BSc, CEng, is a **Senior Corrosion & Metallurgical Engineer** with over **45 years** of extensive experience within the **Oil & Gas, Petrochemical, Refinery, Construction, Aircraft & Shipbuilding** Industry. His wide experiences cover in the areas of **Pressure Vessels**, **Piping Inspection**, **Risk-Based Inspection**, **Fitness-for-Service** (**FFS**), **Metallurgical** Failure, **Metallurgy & Metallurgical Processes, Metallurgical** Lab, Corrosion and **Metallurgy**, Analysis & Prevention, **Corrosion** Fabrication & Inspection, **Fabrication** & **Repair**, **Corrosion** Prevention, **Corrosion** Engineering, **Corrosion Control**, **Corrosion Inhibition**, **Corrosion** Management in Process Operations, **Corrosion** & Prevention of Failures, **Material** Selection, **Cathodic Protection** Systems, **Steel Metallurgy**, **Steel** Structure Welding, **Steelmaking** Slag, **Steel** Making Application, **Steel Making** Process, **Steel** Manufacturing, **Steel Forging**, **Steel** Manufacturing & Process Troubleshooting, **Hot Rolling** Process, **Hot Strip Mill**, **Mill** Operations, **Roll Mill**, **Electric Arc Furnace** (**EAF**), **Slit Rolling**, **Carbon Steel Pipe** Wall Thickness & Grade Selection, **Ferro-Alloys**, **Heat Treatment** & **Prevention Techniques** and **Post Weld Heat Treatment**. Further, he is also well-versed in **Welding** Inspection, **Welding** & **Machine** Techniques, **TIG** & **Arc Welding**, **Shielded Metal Arc Welding**, **Gas Tungsten** & **Gas Metal Arc Welding**, **Welding** Procedure Specifications & Qualifications, **Aluminium Welding**, **Hot Work-Safety**, **SMAW**, **GTAW**, **Welding** Techniques, **Pipeline Welding** Practices, **Welding** Engineering, **Welding** Fatigue & Fracture Mechanics, **Welding Inspection Technology**, **Welding Safety**, **Welding** Defects Analysis, **Welding Technology**, **Welding Problems**, **Welding & Non Destructive** Testing and **Metallurgy Techniques**.

During his career life, Mr. Poulos has gained his practical and field experience through his various significant positions and dedication as the **Chief Executive**, **Head of Technical Studies**, **Manager**, **Senior Consultant**, **Lead Welding Engineer**, **Senior Welding Engineer**, **Design Engineer**, **Sales Engineer**, **Author**, **Welding Instructor**, **Visiting Lecturer** and **Technical Proposal Research Evaluator** from various international companies such as Greek Welding Institute, Hellenic Quality Forum and International Construction Companies such as Shipbuilding, Aircraft Industry and Oil and Gas Industry.

Mr. Poulos is a **Registered Chartered Engineer** and has a **Master's** degree in **Naval Architecture**, a **Bachelor's** degree in **Welding Engineering** and a Master of Business Administration (**MBA**) from the **Sunderland University**, **Aston University** and **Open University**, **UK**, respectively. Further, he is a **Certified Trainer/Instructor**, an active Member of Chartered Quality Institute (**CQI**), The British Welding Institute (**TWI**), The Royal Institution of Naval Architects (**RINA**) and American Welding Society (**AWS**), a Registered **EWF/IW** (European Welding Federation-International Welding Institute W/E) and an **IRCA** Accredited External Quality Systems Auditor through BVQI. He is an **Author** of Technical Book dealing with Protection/Health/Safety in the Welding/Cutting domain and delivered various trainings, seminars, conferences, workshops and courses globally.

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:	***Sunday, 14th of December 2025***
0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of ASME Boiler & Pressure Vessel Code*** *Structure and Purpose of ASME BPVC • Role of Section IX Within the Code • Scope of Pressure-Retaining Items and Process Piping • Relationship to Sections I, II, V, and VIII*
0930 - 0945	*Break*
0945 – 1045	***Scope & Application of Section IX*** *Applicability to Welding and Brazing • Pressure Boundary and Non-Pressure Parts • Manufacturing versus Repair and Alteration Work • Mandatory versus Nonmandatory Appendices*
1045 - 1145	***Key Definitions & Terminologies*** *WPS, PQR, WPQ/WPQTR • Essential, Nonessential, and Supplementary Variables • Base Metals, Filler Metals, F-Numbers, P-Numbers • Backing, Joint Design, and Positions*
1145 - 1230	***Code Organization & Interpretation*** *Understanding Part QW for Welding • Navigating QW Articles and Tables • Use of Figures and Illustrative Examples • How to Use Section IX with Section II and V*
1230 – 1245	*Break*
1245 – 1330	***Responsibilities of Fabricators & Inspectors*** *Documentation Requirements • Retention and Review of Qualifications • Roles of Certifying Authority and Third-Party Inspectors • Common Compliance Issues*

1330 - 1420	***Review of Welding Processes in Section IX*** *Covered Processes (SMAW, GTAW, GMAW, SAW, etc.) • Advantages and Applications of Each Process • Limitations and Code References per Process • Requirements Unique to Each Process*
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: Monday, 15th of December 2025

0730 – 0830	***Procedure Qualification Record (PQR) Requirements*** *Purpose and Documentation of PQR • Mechanical Tests: Tension, Bend, Impact Tests • Supporting a WPS with PQR Data • Essential and Supplementary Variables for Qualification*
0830 – 0930	***Essential Variables for PQR*** *Changes Requiring Requalification • Material Groupings and Thickness Ranges • Welding Positions and Joint Types • Heat Input and Interpass Temperature*
0930 - 0945	*Break*
0945 – 1130	***Supplementary Essential Variables (Toughness)*** *When Impact Testing is Required • Variables Affecting Notch Toughness • Low-Temperature Service Implications • Test Coupon Preparation and Orientation*
1130 - 1230	***Nonessential Variables & Their Flexibility*** *Changes Allowed Without Requalification • Joint Design, Technique, and Backing • Transfer Modes in GMAW • Limits of Acceptable Modifications*
1230 - 1245	*Break*
1245 - 1330	***Test Coupons & Test Positions*** *Dimensions and Preparation • Groove, Fillet, and Overlay Coupons • Welding Positions: Flat, Horizontal, Vertical, Overhead • Role of ASME Section IX Figures (QW-461.3)*
1330 - 1420	***Testing Methods & Acceptance Criteria*** *Tensile Strength and Elongation • Face and Root Bend Tests • Guided Bend and Side Bend Criteria • Impact Test Procedures per Section II Part D*
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 Tuesday, 16th of December 2025

0730 – 0830	***Writing & Reviewing a WPS*** *Format and Required Contents • Weld Metal and Base Metal Specification • Filler Metal and Shielding Gas Details • Joint Design, Backing, and Technique*
0830 – 0930	***Essential Variables for WPS (by Process)*** *Specific Changes Affecting Each Process • Examples for SMAW, GTAW, GMAW, SAW • Overlay and Cladding Process Variables • Interpreting QW-252 Tables*
0930 - 0945	*Break*

0945 – 1130	***Range of Qualification*** *Thickness Ranges for Base and Weld Metal • Diameter Limits for Pipes • Multiple Processes and Joint Types • Qualification for Production Use*
1130 - 1230	***Supporting Multiple WPS with One PQR*** *When and How a Single PQR Supports Several WPS • Limits of Combination and Extrapolation • Using the Same PQR for Different Thicknesses • Format for Referencing PQR in WPS*
1230 - 1245	*Break*
1245 - 1330	***Variables for Prequalified WPS (Code Cases)*** *When Prequalification Applies • Advantages and Limitations • Examples from Industry Practice • Code Cases versus Standard ASME Guidance*
1330 - 1420	***WPS Qualification Examples & Workshop*** *Group Activity on Preparing a Sample WPS • Matching PQR Data with WPS • Peer Review and Critique • Troubleshooting Typical WPS Errors*
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*

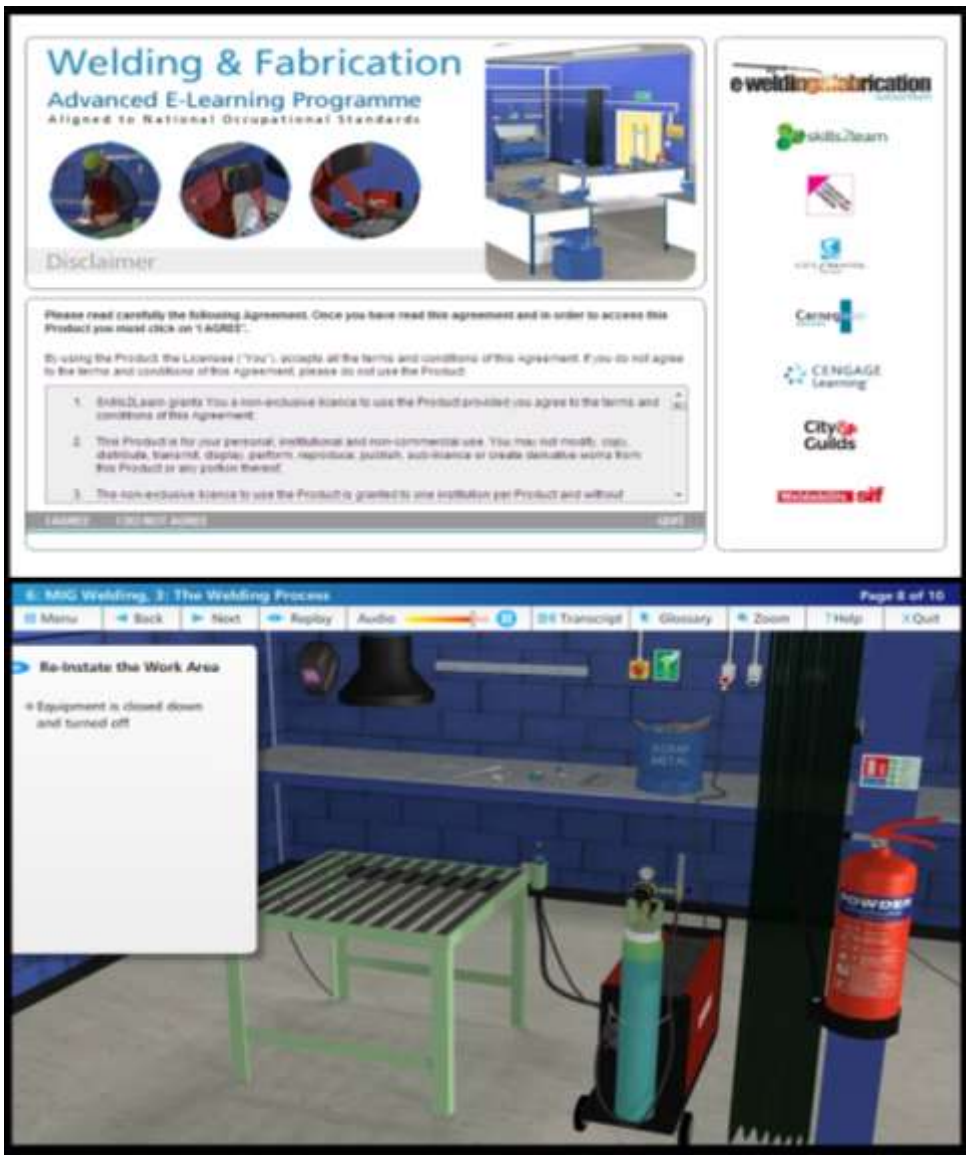
Day 4: ***Wednesday, 17th of December 2025***

0730 – 0830	***Welder/Welding Operator Qualification Overview*** *Requirements for Performance Qualification • Types of Joints and Test Positions • Acceptance Criteria for Welder Tests • Qualified Ranges and Limitations*
0830 – 0930	***Essential Variables for Welder Qualification*** *Changes that Invalidate WPQ • Position, Process, and Material Group • Joint Design and Base Metal Thickness • Role of Simulated Production Welds*
0930 - 0945	*Break*
0945 – 1130	***WPQ Test Methods & Acceptance Criteria*** *Visual Inspection and Bend Test • Radiographic and Ultrasonic Examination • Fillet Weld Break and Macro-Etch • Discontinuity Limits and Defect Rejection*
1130 - 1230	***WPQ Recordkeeping & Certification*** *Documentation Format (WPQTR) • Validity Period and Continuity Log • Responsibility of Employer/Fabricator • Requalification and Retraining Needs*
1230 - 1245	*Break*
1245 - 1330	***Multiple Process Qualifications*** *When to Combine Tests • Multi-Process Joints and Hybrid Qualifications • Use of Combination Coupons • Review of QW-461.9 Table*
1330 - 1420	***Performance Qualification Exercises*** *Mock Qualification Test Scenarios • Group Interpretation of Results • Filling Out WPQTRs • Applying WPS During Actual Welding*
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:	Thursday, 18th of December 2025
0730 – 0830	***Brazing & Other Special Processes (QW-290)*** *Basic Principles of Brazing • Essential/Nonessential Variables for Brazing • Test Requirements for Procedure and Performance • Special Considerations for Dissimilar Materials*
0930 - 0945	*Break*
0945 - 1030	***Nonconformities & Common Errors in Section IX*** *Incomplete WPS/PQR Documentation • Misapplication of Thickness or Diameter Ranges • Unqualified Welders Performing Code Work • Misunderstanding of Essential Variable Changes*
1030 - 1130	***Auditing & Compliance Verification*** *Internal and External Audit Expectations • Checklist for Code Compliance • Handling NCRs and Observations • Roles of QA/QC During ASME Audits*
1130 - 1230	***Case Studies & Industry Examples*** *Boiler Tube Welding Failure Analysis • Improperly Qualified PQR and Legal Disputes • Welder Requalification and Root Cause Analysis • Fabrication Errors Due to WPS Misunderstanding*
1230 - 1245	*Break*
1245 - 1345	***Integration with ASME Sections I, VIII, & B31.3*** *Section I Pressure Part Qualification • Section VIII Vessel Manufacturing Considerations • Section B31.3 Piping System Welding • Harmonization and Cross-Reference of Variables*
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 "E-Welding & Fabrication" simulator.



E-Welding & Fabrication

Course Coordinator

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