



COURSE OVERVIEW FE0670-10D
API 510: Pressure Vessel Inspector
(API Exam Preparation Training)

Course Title

API 510: Pressure Vessel Inspector (API Exam Preparation Training)

Course Date/Venue

September 14-25, 2026/Congress 2 Meeting Room, VOCO Dubai, an IHG Hotel, Sheikh Zayed Road, Dubai, UAE

Exam Window & Venue

January 02-22, 2027/Abu Dhabi, Dubai, Al-Khobar, Jeddah, Kuwait, Amman, Beirut, Cairo, Manama, Muscat and Istanbul. Participant has the option to attend at any of the above cities

Exam Registration Closing Date

October 22, 2026

Course Duration/Credits

Ten days (80 hours)/8.0 CEUs/80 PDHs



Course Reference

FE0670-10D

Course Description



This practical and highly-interactive course includes practical sessions and exercises where participants carryout welding inspection. Theory learnt in the class will be applied using our state-of-the-art tools.



This course is designed to train individuals who are interested in obtaining the API 510 Pressure Vessel Inspector Certification, as well as those who are seeking a better understanding of ASME Section VIII and IX code requirements. Included with the course is a pre-study guide and student classroom workbook. The student receives instruction regarding how to take the test, as well as insight into the intricacies of "real world" situations. Daily tests are designed to gauge students' proficiency and understanding of the material.



The course covers head and shell calculations, hydrostatic test pressure calculations, reinforcement calculations, shell external pressure calculations, impact test requirements and determination, development and review of welding documentation and NDE requirement.

Haward Technology is proud of its **90% pass rate** on all our API sponsored courses.



Course Objectives/Outcomes & Benefits for the Participants

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

- Get prepared for the next API 510 exam and have enough knowledge and skills to pass such exam in order to get the API 510 certification
- Apply and gain an in-depth knowledge on API 510 pressure vessel code: maintenance, inspection, rating, repair and alteration (API exam preparation training)
- Identify the service restrictions, joint efficiencies and radiography and discuss vessels under internal pressures like shell and head calculations
- Recognize maximum allowable working pressure and define hydrostatic head pressure and hydrostatic, pneumatic tests and test gauges
- Employ postweld heat treatment and identify UW-16 minimum requirements for attachment welds at openings
- Describe and identify the UCS66_UG84 charpy impact
- Carryout material name plates data reports and apply corrosion calculations
- Discuss ASME section IX overview and write a welding procedure specification and welders qualification
- Review the section VIII, division 1, rules for constructing pressure vessels covering sections A, B, and C
- Review WPS's and PQR's, API 510 and define ASME section-V: NDE articles 1,2,6,7 and 23 (section SE-797 only)
- Analyze API 577 welding inspection and metallurgy, implement how part 0 works and damage mechanisms part 1 and 2
- Discuss API 572 pressure vessel inspection and API 576 pressure relieving devices
- Describe API 578 material verification program for new and existing alloy piping systems API recommended practice
- Apply repair of pressure equipment and piping in accordance with ASME PCC-2 standard
- Discuss the applicability and limitations of repair methods covered by ASME PCC-2 and choose the correct repair technique for given defects
- Employ cost-effective repairs and detailed repair methods and inspection techniques
- Inspect pressure vessels, rating, repair and alteration and apply remaining life calculation of pressure vessels
- Identify butt-welded insert plates in pressure components, weld overlay to repair internal thinning, welded leak box repair and full encirclement steel reinforcing sleeves for piping
- Recognize fillet welded patches, alternatives to post-weld heat treatment, in-service welding onto carbon steel pressure components or pipelines and weld build-up, weld overlay and clad restorationx
- Carryout flange repair, mechanical clamp repair, inspection and repair of shell and tube heat exchangers and examination and testing
- Apply pressure and tightness testing of piping and equipment, pneumatic testing and non-destructive examination in lieu of pressure testing for repairs and alterations
- Discuss the relevance of ASME PCC-2 standard with API 510 and API 570 codes as well as implement proper documentation and records of repairs



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 prepares participants for the API 510 exam. It is designed for those involved in the maintenance, inspection, rating, repair and alteration of pressure vessel such as inspectors and inspection engineers. Other engineers, managers and technical staff who are dealing with pressure vessel will also benefit from this course.

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.

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.

Training Fee

US\$ 8,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Exam Fees

US\$ 1,500 per Delegate + **VAT**.



Exam Eligibility & Structure

Exam Candidates shall have the following minimum pre-requisites:-

Education	Years of Experience	Experience Required
BS or higher in engineering or technology or 3+ years of military service in a technical role (Dishonorable discharge disqualifies credit)	1 year	Supervision or performance of inspection activities as described in API 510
2-year Associate's degree or certificate in engineering or technology or 2 years of military service in a technical role (Dishonorable discharge disqualifies credit)	2 years	Design, fabrication, repair, operation, or inspection of pressure vessels, of which one year <u>must</u> be in supervision or performance of inspection activities as described in API 510
High school diploma or equivalent	3 years	Design, fabrication, repair, operation, or inspection of pressure vessels, of which one year <u>must</u> be in supervision or performance of inspection activities as described in API 510
No formal education	5 or more years	Design, fabrication, repair, operation, or inspection of pressure vessels, of which one year <u>must</u> be in supervision or performance of inspection activities as described in API 510

Applicable Codes & Standards

Listed below are the effective editions of the publications required for next API-510, Pressure Vessel Inspector Examination: -

- **API Standard 510, Pressure Vessel Inspection Code: In-service Inspection, Rating, Repair, and Alteration, 11th Edition, October 2022**, with Errata 1 (March 2023), Errata 2 (2025)
- **API Recommended Practice 571, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry, 3rd Edition, March 2020**

ATTENTION: Only the following sections / mechanism from RP 571 are included on the exam:

Section	2	Terms and Definitions
Par.	3.3	Amine Stress Corrosion Cracking
	3.8	Atmospheric Corrosion
	3.9	Boiler Water and Steam Condensate Corrosion
	3.11	Brittle Fracture
	3.14	Caustic Corrosion
	3.15	Caustic Stress Corrosion Cracking
	3.17	Chloride Stress Corrosion Cracking
	3.22	Corrosion Under Insulation (CUI)
	3.27	Erosion/Erosion-Corrosion



- 3.35 High-temperature H₂/H₂S Corrosion
 - 3.36 High-temperature Hydrogen Attack
 - 3.37 Hydrochloric Acid Corrosion
 - 3.46 Naphthenic Acid Corrosion
 - 3.61 Sulfidation
 - 3.67 Wet H₂S Damage (Blistering/HIC/SOHIC/SCC)
- **API Recommended Practice 572**, *Inspection Practices for Pressure Vessels*, 5th Edition, **November 2023**
 - **API Recommended Practice 576**, *Inspection of Pressure-Relieving Devices*, 5th Edition, **September 2024**
 - **API Recommended Practice 577**, *Welding Processes, Inspection and Metallurgy*, 3rd Edition, **October 2020, Errata 1 (September 2025)**
 - **API Recommended Practice 578**, *Material Verification Program for New and Existing Assets*, 4th edition, **February 2023**
 - **American Society of Mechanical Engineers (ASME)**, *Boiler and Pressure Vessel Code*, **2025 Edition**
 - i. **Section V**, *Nondestructive Examination, Articles 1, 2, 6, 7 and 23 (Section SE-797 only)*
 - ii. **Section VIII**, *Rules for Construction of Pressure Vessels, Division 1; Introduction (U), UG, UW, UCS, Appendices 1-4, 6, 8 and 12*
 - iii. **Section IX**, *Qualification Standard for Welding, Brazing and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators, (Welding only)*
 - **American Society of Mechanical Engineers (ASME) PCC-2**, *Repair of Pressure Equipment and Piping*, **2022**

ATTENTION: The Examination will cover each referenced Article and its Appendices

Article 101: Scope, Organization, and Intent

Article 201: Butt-Welded Insert Plates in Pressure Components

Article 202: External Weld Buildup to Repair Internal Thinning

Article 209: Alternatives to Postweld Heat Treatment

Article 210: In-Service Welding Onto Carbon Steel Pressure Components or Pipelines

Article 211: Weld Buildup, Weld Overlay, and Clad Restoration

Article 212: Fillet Welded Patches

Article 215: Repair Welding Considerations for Cr-Mo Steel Pressure Vessels

Article 216: Welded Hot Taps in Pressure Equipment or Pipelines

Article 304: Flaw Excavation and Weld Repair

Article 305: Flange Repair and Conversion

Article 312: Inspection and Repair of Shell and Tube Heat Exchangers

Article 501: Pressure and Tightness of Piping and Equipment

Article 502: Nondestructive Examination in Lieu of Pressure Testing for Repairs and Alternations

API Exam Format

All API exams are organized online in one of the Prometric Examination centers.

The only document required is the students Photo ID. No other documents, books, standards, codes or publications whatsoever are allowed during the exam.

All applicable codes and standards will be available online in the exam station.





API Certificate(s)

- (1) API-510 certificate will be issued to participants who have successfully passed the API-510 examination.



- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 28-Feb-21
HTME No: 74882
Participant Name: Salem Ghanem

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
FE0670-10D	API 510: Pressure Vessel Inspector (APT Exam Preparation Training)	February 15-28, 2022	80	8.0

Total No. of CEUs Earned as of TOR Issuance Date: 8.0

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Jeryl Castillo
Academic Director

Haward Technology has been approved as an Accredited Provider by the International Association for Continuing Education and Training (IACET). 2005 Convention Way, Suite 400, Harahan, MO 63071, USA. In receiving this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1201B Standard which is widely recognized as the standard of good practice internationally. As a result of this Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1201B Standard.

Haward Technology's courses meet the professional education requirements for participants seeking Continuing Education Units (CEUs). The courses are designed to provide the necessary knowledge and skills to meet the requirements of the 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 to quantify courses of continuing education.

Haward Technology is accredited by:

- BAC
- ILM
- IACET
- API

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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**. 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 **8.0 CEUs** (Continuing Education Units) or **80 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:



(1) **Ms. Maria Melkadze**, MSc, BSc, is a **Senior Inspection Engineer** with Extensive Experience within the **Oil & Gas, Petrochemical and Refinery industries**. Her wide expertise includes **Pressure Vessel Inspection, ASME VIII Pressure Vessel Design, Fabrication & Testing, Pressure Vessel & Piping Systems, Boiler & Pressure Vessel Materials, Piping Inspection, Plant Utility Piping System, Piping System Repair & Maintenance, Piping System & Pipeline Maintenance, Process Piping Design & Mechanical Integrity, Risk-Based-Inspection (RBI) & Fitness-for-Service (FFS), Tank Inspection, Repair, Alteration & Reconstruction, Tank Farm & Tank Terminal Safety & Integrity Management, Aboveground Storage Tank inspection, Pressure Systems Integrity, Risk Management & Production Efficiency, Defect Elimination, Engineering Processes & Work Flows Standardization and inspection management tools such as SAP, Maximo, ACET and IDMS.**

During her career life, Ms. Melkadze has gained his practical and field experience through her various significant positions and dedication as the **Pressure Systems Integrity Engineer, Pressure Systems Integrity Engineer Challenger and Inspector of British Petroleum.**

Ms. Melkadze has a **Master's degree in Industrial Engineering and Technology in Specialization of Refrigerating Machinery & Technology** and a **Bachelor's degree in Industrial Engineering and Technology**. Further, she is a **Certified API 510 Pressure Vessel Inspector, Certified API 570 Piping Inspector, Certified API 653 Aboveground Storage Tank Inspector, a Certified Project Management Professional (PMI-PMP), a Professional Scrum Product Owner I (PSPO I), a Professional Scrum Master I (PSM I), a Certified Professional Agile Coach, a Certified Professional Agile Facilitator and a Certified Instructor/Trainer.** She is also a member of the **Institution of Mechanical Engineers** and a has delivered numerous trainings, courses, seminars and workshops internationally.



AND,



(2) **Mr. Hesham Moharram**, is a **Senior Inspection Engineer** with over **30 years** of industrial experience in the **Oil & Gas, Refineries** and **Petrochemical** industries. His expertise includes **Facility Integrity, Technical Integrity, Integrated Safety Management Plan, Inspection, Repair, Maintenance, Alteration and Reconstruction of Aboveground Storage Tanks, Pressure Vessels, Piping Inspection, Risk-Based Inspection, Fitness-for-Service (FFS), Asset Integrity Management, Plant Inspection & Corrosion Engineering, Pipeline Integrity Assessment, Integrity Management, Pipeline Rehabilitation & Repair, Pipeline Design & Maintenance, Corrosion Monitoring & Cathodic Protection, Pressure & Leak Testing, Metallurgy, Corrosion & Prevention of Failures, Material Selection & Properties, Physical Metallurgy of Steel, Welding Technology, Fabrication & Inspection, Conventional & Advanced Non-destructive Testing (NDT), Process Safety Hazard Analyses (PHA), Risk Assessment, Pigging & Pipe Support and Acoustic Emission**. Further, he is also well-versed in Quality Assurance & Quality Control, **HAZOP**, Permit-to-Work, Hazard Identification, Safety Meeting, Accident Investigation, Emergency Response, Task Risk Assessment, Root Cause & Failure Analysis, Fire Fighting, First Aid Basic, CPR, H₂S Awareness, Distillation Units, Preventive Maintenance, FEED, Contract Management, Stress Management, Coaching & Mentoring Skills, Interpersonal Skills and Communication Skills. He is currently the **Senior Inspection Engineer** wherein he is responsible in various inspection works like fitness-for-service, remaining life assessments, risk based inspection, intelligent pigging, problematic pipe supports, non-destructive testing and acoustic emission.

Throughout his career life, Mr. Hesham has provided significant contributions to the companies he has worked with, having filled key positions such as being the **Senior Inspection Engineer, Inspection Engineer, Production Engineer, API Instructor, QA/QC and Supervisor** for international companies such as Abu Dhabi Company for Onshore Oil Operations (**ADCO**), Suez Oil Company (**SUCO**), Cairo Oil Refining Company (**CORC**) Refinery, DURA Refinery, State Company for Oil Projects (**SCOP-IRAQ**) and **Iron & Steel**.

Mr. Moharram has a **Bachelor's** degree in **Metallurgical Engineering**, from the Suez Canal University. Further, he is a **Certified Instructor/Trainer**, a **Certified Pressure Vessel Inspector (API-510)**, **Certified Piping Inspector (API-570)**, **Certified Aboveground Storage Tanks Inspector (API-653)**, **Certified Risk Based Inspector (API-580)**, an **ASNT Certified Level II** in **UT, RT, MT, PT** and **Eddy Current Testing**.

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: Monday, 14th of September 2026

0730 – 0800	Registration & Coffee
0800 – 0810	Welcome & Introduction
0810 – 0825	PRE-TEST
0825 – 0900	Course Overview – API 510 Body of Knowledge Requirements Exam Portal Overview



0900 – 1000	Service Restrictions - Joint Efficiencies - Radiography UW-3 Weld Categories • UW-51 RT Examination of Welded Joints • UW-52 Spot Examination of Welded Joints
1000 – 1015	Break
1015 – 1230	Service Restrictions - Joint Efficiencies - Radiography (cont'd) UW-11 RT & UT Examinations • UW-12 Maximum Allowable Joint Efficiencies • Exercises UW 3, 11 & 12
1230 – 1330	Lunch
1330 – 1515	Vessels Under Internal Pressure – Shell & Head Calculations UG-27 Thickness of Shells under Internal Pressure
1515 – 1530	Break
1530 – 1650	Vessels Under Internal Pressure – Shell & Head Calculations (cont'd) UG-32 Formulas & Rules for Using Formed Heads
1650 – 1700	Recap
1700	End of Day One

Day 2: Tuesday, 15th of September 2026

0730 – 0830	Review of Day 1
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1230	Maximum Allowable Working Pressure UG-98 Maximum Allowable Working Pressure
1230 – 1330	Lunch
1330 – 1515	Hydrostatic Head Pressure Hydrostatic Head Calculations
1515 – 1530	Break
1530 – 1620	Hydrostatic – Pneumatic Tests UG-99 Hydrostatic Test Pressure & Procedure • UG-100 Pneumatic Test Pressure & Procedure • UG-102 Test Gages
1620 – 1650	Quiz 1
1650 – 1700	Recap
1700	End of Day Two

Day 3: Wednesday, 16th of September 2026

0730 – 0830	Review of Day 2
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1230	Postweld Heat Treatment
1230 – 1330	Lunch
1330 – 1515	Cylinder under External Pressure UG-28 Thickness of Shells & Tubes (External Pressure)
1515 – 1530	Break
1530 – 1650	Charpy Impact Testing UCS-66 Materials • UCS-67 Impact Testing of Welding Procedures • UCS-68 Design • UG-84 Charpy Impact Test Requirements
1650 – 1700	Recap
1700	End of Day Three



Day 4: Thursday, 17th of September 2026

0730 – 0830	Review of Day 3
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1230	Fillet Welds & Reinforcement UW-16 Weld Size Determination • UG-36 Openings in Vessels • UG-37 Reinforcement of Openings • UG-40 Limits of Reinforcement
1230 – 1330	Lunch
1330 – 1515	Materials Name Plates Data Reports UG-77 Material Identification • UG-93 Inspection of Materials • UG-116 Name Plate Markings
1515 – 1530	Break
1530 – 1620	Materials Name Plates Data Reports (cont'd) UG-119 Name Plates • UG-120 Data Reports
1620 – 1650	Quiz 2
1650 – 1700	Recap
1700	End of Day Four

Day 5: Friday, 18th of September 2026

0730 – 0830	Review of Day 4
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1230	Corrosion Calculations Inspection Interval • Corrosion Rate & Remaining Life • Long & Short Term Corrosion Rates
1230 – 1330	Lunch
1330 – 1515	ASME Section-IX Overview Article I General Requirements • Article II Welding Procedure Qualifications
1515 – 1530	Break
1530 – 1650	ASME Section-IX Overview (cont'd) Article III Welding Performance Qualifications • Article IV Welding Data
1650 – 1700	Recap
1700	End of Day Five

Day 6: Monday, 21st of September 2026

0730 – 0830	Review of Day 5
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1230	Writing a Welding Procedure Specification Welding Procedures by Essential Variables
1230 – 1330	Lunch
1330 – 1515	Welder's Qualification Welder Testing & Qualification
1515 – 1530	Break
1530 – 1620	Welder's Qualification (cont'd)
1620 – 1650	Quiz 3
1650 – 1700	Recap
1700	End of Day Six



Day 7: Tuesday, 22nd of September 2026

0730 – 0830	Review of Day 6
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1130	Review of WPS's & PQR's Practice WPS/PQR reviews
1130 – 1230	Section VIII, Division 1, Rules for Constructing Pressure Vessels Section A: General Requirements • Section B: Requirements Pertaining to Methods of Fabrication of Pressure Vessels • Section C: Requirements Pertaining to Classes of Materials
1230 – 1330	Lunch
1330 – 1515	ASME Section-V: NDE Article 1 General Requirements • Article 2 Radiographic Testing Appendix 4 - Section VIII Rounded Indications • Article 23 SE-797 Standard Practice for Measuring Thickness by the Pulse-Echo Contact Method • Appendix 12 - Section VIII Ultrasonic Acceptance Criteria
1515 – 1530	Break
1530 – 1650	ASME Section-V: NDE (cont'd) Article 6 - Penetrant Testing • Appendix 8 - Section VIII Methods for Liquid Penetrant Exam • Article 7 - Magnetic Particle Examination • Appendix 6 - Section Magnetic Particle Examination
1650 – 1700	Recap
1700	End of Day Seven

Day 8: Wednesday, 23rd of September 2026

0730 – 0830	Review of Day 7
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1130	API RP 577 Welding Inspection & Metallurgy Definitions • Welding Inspection • Welding Processes • Welding Procedure • Welding Materials
1130 – 1230	API RP 577 Welding inspection & Metallurgy (cont'd) Welder Qualification • Non-Destructive Examination • Metallurgy • Refinery & Petrochemical Welding Issues • Terminology & Symbols
1230 – 1330	Lunch
1330 – 1430	API RP 577 Welding inspection & Metallurgy (cont'd) Actions to Address Improperly Made Production Welds • Welding Procedure Review • Guide to Common Filler Metals • Example Report of RT Results
1430 – 1515	Part 0 How does it Work?
1515 – 1530	Break
1530 – 1620	API 571: Damage Mechanisms Part 1 Temper Embrittlement • Brittle Fracture • Thermal Fatigue • Erosion/Erosion-Corrosion • Mechanical Failure • Atmospheric Corrosion • Corrosion Under Insulation (CUI) • Cooling Water Corrosion • Boiler Water Condensate Corrosion • Sulfidation
1620 – 1650	Quiz 4
1650 – 1700	Recap
1700	End of Day Eight



Day 9: Thursday, 24th of September 2026

0730 – 0830	Review of Day 8
0830 – 1000	Exercise with Review
1000 – 1015	Break
1015 – 1100	API 571: Damage Mechanisms Part 1 (cont'd) Chloride Stress Corrosion Cracking (Cl-SCC) • Corrosion Fatigue • Caustic Stress Corrosion Cracking (Caustic Embrittlement) • Wet H ₂ S Damage (Blistering/HIC/SOHIC/SCC) • High Temperature Hydrogen Attack (HTHA)
1100 – 1145	API 571: Damage Mechanisms Part 2 Temper Embrittlement • Brittle Fracture • Thermal Fatigue • Erosion/Erosion-Corrosion • Mechanical Failure • Atmospheric Corrosion • Corrosion Under Insulation (CUI) • Cooling Water Corrosion
1145 – 1230	API 571: Damage Mechanisms Part 2 (cont'd) Boiler Water Condensate Corrosion • Sulfidation • Chloride Stress Corrosion Cracking (Cl-SCC) • Corrosion Fatigue • Caustic Stress Corrosion Cracking (Caustic Embrittlement) • Wet H ₂ S Damage (Blistering/HIC/SOHIC/SCC) • High Temperature Hydrogen Attack (HTHA)
1230 – 1330	Lunch
1330 – 1430	Overview – API 510 Inspections of Pressure Vessels Scope • Organization • Types & Definitions of Maintenance Inspections • Welding on Pressure Vessels • Repairs & Alterations Overview – API 576 Pressure Relieving Devices • Scope • Types of Pressure Relieving Devices • Applications • Limitations
1430 – 1515	Overview – API 572 Inspection of Pressure Vessels Scope • Reasons for Inspection • Causes of Deterioration • Methods of Repairs • Inspection Records & Report
1515 – 1530	Break
1530 – 1620	API 578: Material Verification Program for New & Existing Alloy Piping Systems API Recommended Practice
1620 – 1650	Quiz 5
1650 – 1700	Recap
1700	End of Day Nine

Day 10: Friday, 25th of September 2026

0730 – 0830	Review of Day 9
0830 – 1000	ASME PCC-2: Repair of Pressure Equipment & Piping Scope, Organization & Intent • Applicability & Limitations of Repair Methods Covered by ASME PCC-2 • Choosing Correct Repair Technique for Given Defects • Cost-effective Repairs
1000 – 1015	Break
1015 – 1130	ASME PCC-2: Repair of Pressure Equipment & Piping (cont'd) Detailed Repair Methods & Inspection Techniques • Inspection of Pressure Vessels, Rating, Repair & Alteration • Remaining Life Calculation of Pressure Vessels
1130 – 1230	ASME PCC-2: Welded Repairs Butt-Welded Insert Plates in Pressure Components • Weld Overlay to Repair Internal Thinning • Welded Leak Box Repair • Full Encirclement Steel Reinforcing Sleeves for Piping • Fillet Welded Patches • Alternatives to Post-Weld Heat Treatment • In-Service Welding onto Carbon Steel Pressure Components or Pipelines • Weld Build-up, Weld Overlay & Clad Restoration
1230 – 1300	Lunch



1300 - 1330	ASME PCC-2: Mechanical Repairs (Non-Welding Repairs) Flange Repair • Mechanical Clamp Repair • Inspection & Repair of Shell & Tube Heat Exchangers • Examination & Testing
1330 - 1515	ASME PCC-2: Mechanical Repairs (Non-Welding Repairs) (cont'd) Pressure & Tightness Testing of Piping & Equipment • Pneumatic Testing-Do's & Don'ts • Non-destructive Examination in Lieu of Pressure Testing for Repairs & Alterations • Relevance of ASME PCC-2 Standard with API 510 & API 570 Codes • Documentation & Records of Repairs
1515 - 1530	Break
1530 - 1615	General Course Material Review & Discussion
1615 - 1630	POST-TEST
1630 - 1645	Course Conclusion
1645 - 1700	Presentation of Course Certificates
1700	End of Course

MOCK Exam

Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward's Portal. Each Participant will be given a username and password to log in Haward's Portal for the Mock exam during the 60 days following the course completion. Each participant has only one trial for the MOCK exam within this 60-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.

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 welding inspection using the "American Welding Society (AWS) Tool Kit" and "Structural Weld Replica Kit", suitable for classroom training.



AWS Tool Kit



Structural Weld Replica Kit

Course Coordinator

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