# 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**
December 06-17, 2026/TBA Meeting Room, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

**Exam Window & Venue**
May 07-28, 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**
February 25, 2027

**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

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.

## 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<br>or<br>3+ years of military service in a technical role<br><br>(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<br>or<br>2 years of military service in a technical role<br><br>(Dishonorable discharge disqualifies credit) | 2 years | Design, fabrication, repair, operation, or inspection of pressure vessels, of which one year must 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 must 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 must 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 $H_2/H_2S$ Corrosion
3.36 High-temperature Hydrogen Attack
3.37 Hydrochloric Acid Corrosion
3.46 Naphthenic Acid Corrosion
3.61 Sulfidation
3.67 Wet $H_2S$ 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.



**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:



**Mr. Mohamed Amer**, BSc, AWS-CWI, CWE, ASNT-NDT, API, is a **Senior Inspection Engineer** with almost **20 years** of extensive industrial experience within the **Oil & Gas**, **Refinery** and **Petrochemical** Industries. His expertise widely covers in the areas of **Welding Inspection**, **Documentation & Qualification**, **Welding Technology & Metallurgy**, **Weld & Base Metal** Discontinuities, **Welding & Fabrication**, **Material Science & Corrosion**, **Fabrication** & Types of Welding Defects, **Corrosion** Prevention & Control, Risk Based Inspection **(RBI**), **Asset Integrity** Management, **Corrosion & Material** Management, **Refractory** Inspection, **Corrosion & Material** Inspection, **Pressure Vessels** Inspection, **Piping** Inspection, **Above Ground Storage Tank** Inspection, Source Inspector-Fixed Equipment Inspection, **Painting** Inspection, **Piping** Fabrication & Erection, **Plant Equipment** inspection, **Valve** Inspection & Maintenance, Quality Assurance/Quality Control (**QA/QC**) Systems, **Painting & Coating** Inspection, **Radiographic** Testing, **Ultrasonic** Testing, **Magnetic** Particle Testing, **Liquid Penetrant** Testing and **Visual** Testing. Further, he is also well-versed in most of international codes, standards and specifications such as ASME, API, ASTM, EEMUA, AWS, NACE, SSPC, NB, Shell, BP, BG and Aramco standards as well as RBI Software (VISIONS, API RBI, RBMI, P-RBI, Credo and Ultra-Pipe), FFS Software (Signal FFS and Code Calc.), Design Software (PV Elite and ETANK) and Asset Management Software (Credo, Maximo and SAP).

During his career life, Mr. Amer has gained his practical and field experience through his various significant positions and dedication as the **Technical Support Manager**, **Inspection Engineer**, **Asset Integrity Integrity Engineer**, **RBI Engineer**, **Asset Integrity RBI Specialist**, **API Inspector** and **Senior Instructor/Lecturer** for various international companies like the CIS Egypt, Angola LNG, DNV, Dolphin Energy, Qatar Petroleum, Egyptian LNG and Khalda Petroleum Company.

Mr. Amer has a **Bachelor's** degree in **Metallurgy and Material Science Engineering** and holds a **Diploma** in **International Welding Engineer** from the **International Institute of Welding**. Further, he is a **Certified Instructor/Trainer**, a Certified Pressure Vessels Inspector (**API 510**), a Certified Piping Inspector (**API 570**), a Certified Above Ground Storage Tank Inspector (**API 653**), a Certified Risk Based Inspector (**API 580**), a Certified Corrosion & Material Specialist (**API 571**), a Certified Welding Inspection & Metallurgy Professional (**API 577**), a Certified Tank Entry Supervisor (**API-TES**), a Certified Refractory Personnel (**API-936**), a Certified Source Inspector-Fixed Equipment (**API-SIFE**), a **Certified Welding Inspector** (**AWS-CWI**) and a **Certified Welding Educator** (**AWS-CWE**) from the American Welding Society, a **Certified BGAS-CSWIP Painting Inspector Grade 2**, a **Certified CSWIP Senior Welding Inspector** and a **Certified ASNT-NDT Level II** in Radiographic Testing (**RT**), Ultrasonic Testing (**UT**), Magnetic Particle Testing (**MT**), Liquid Penetrant Testing (**PT**) and Visual Testing (**VT**). Moreover, he is a Certified **IRCA Lead Auditor** (ISO QMS 9001:2015) and has delivered innumerable trainings, courses, seminars, conferences and workshops internationally.

## 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, 06th of December 2026***

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|---|---|
| *0730 – 0800* | *Registration & Coffee* |
| *0800 – 0810* | *Welcome & Introduction* |
| *0810 – 0825* | ***PRE-TEST*** |
| *0825 – 0900* | ***Course Overview – API 510 Body of Knowledge Requirements***<br>***Exam Portal Overview*** |
| *0900 – 1000* | ***Service Restrictions - Joint Efficiencies - Radiography***<br>*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)***<br>*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***<br>*UG-27 Thickness of Shells under Internal Pressure* |
| *1515 – 1530* | *Break* |
| *1530 – 1650* | ***Vessels Under Internal Pressure – Shell & Head Calculations (cont'd)***<br>*UG-32 Formulas & Rules for Using Formed Heads* |
| *1650 – 1700* | ***Recap*** |
| *1700* | *End of Day One* |

***Day 2:*** ***Monday, 07th of December 2026***

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|---|---|
| *0730 – 0830* | ***Review of Day 1*** |
| *0830 – 1000* | ***Exercise with Review*** |
| *1000 – 1015* | *Break* |
| *1015 – 1230* | ***Maximum Allowable Working Pressure***<br>*UG-98 Maximum Allowable Working Pressure* |
| *1230 – 1330* | *Lunch* |
| *1330 – 1515* | ***Hydrostatic Head Pressure***<br>*Hydrostatic Head Calculations* |
| *1515 – 1530* | *Break* |
| *1530 – 1620* | ***Hydrostatic – Pneumatic Tests***<br>*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:*** ***Tuesday, 08th of December 2026***

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|---|---|
| *0730 – 0830* | ***Review of Day 2*** |
| *0830 – 1000* | ***Exercise with Review*** |
| *1000 – 1015* | *Break* |
| *1015 – 1230* | ***Postweld Heat Treatment*** |
| *1230 – 1330* | *Lunch* |

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|---|---|
| 1330 – 1515 | ***Cylinder under External Pressure***<br>*UG-28 Thickness of Shells & Tubes (External Pressure)* |
| 1515 – 1530 | *Break* |
| 1530 – 1650 | ***Charpy Impact Testing***<br>*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: Wednesday, 09th of December 2026***

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|---|---|
| 0730 – 0830 | ***Review of Day 3*** |
| 0830 – 1000 | ***Exercise with Review*** |
| 1000 – 1015 | *Break* |
| 1015 – 1230 | ***Fillet Welds & Reinforcement***<br>*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***<br>*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)***<br>*UG-119 Name Plates ● UG-120 Data Reports* |
| 1620 – 1650 | ***Quiz 2*** |
| 1650 – 1700 | ***Recap*** |
| 1700 | *End of Day Four* |

***Day 5: Thursday, 10th of December 2026***

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

***Day 6: Sunday, 13th of December 2026***

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|---|---|
| 0730 – 0830 | ***Review of Day 5*** |
| 0830 – 1000 | ***Exercise with Review*** |
| 1000 – 1015 | *Break* |
| 1015 – 1230 | ***Writing a Welding Procedure Specification***<br>*Welding Procedures by Essential Variables* |
| 1230 – 1330 | *Lunch* |

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| 1330 – 1515 | ***Welder's Qualification***<br>*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:*** ***Monday, 14th of December 2026***

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|---|---|
| 0730 – 0830 | ***Review of Day 6*** |
| 0830 – 1000 | ***Exercise with Review*** |
| 1000 – 1015 | *Break* |
| 1015 – 1130 | ***Review of WPS's & PQR's***<br>*Practice WPS/PQR reviews* |
| 1130 - 1230 | ***Section VIII, Division 1, Rules for Constructing Pressure Vessels***<br>*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***<br>***Article 1*** *General Requirements ●* ***Article 2*** *Radiographic Testing*<br>***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)***<br>***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:*** ***Tuesday, 15th of December 2026***

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|---|---|
| 0730 – 0830 | ***Review of Day 7*** |
| 0830 – 1000 | ***Exercise with Review*** |
| 1000 – 1015 | *Break* |
| 1015 – 1130 | ***API RP 577 Welding Inspection & Metallurgy***<br>*Definitions ● Welding Inspection ● Welding Processes ● Welding Procedure ● Welding Materials* |
| 1130 - 1230 | ***API RP 577 Welding inspection & Metallurgy (cont'd)***<br>*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)***<br>*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* |

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|---|---|
| *1530 – 1620* | ***API 571: Damage Mechanisms Part 1***<br>*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:*** ***Wednesday, 16th of December 2026***

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| *0730 – 0830* | ***Review of Day 8*** |
| *0830 – 1000* | ***Exercise with Review*** |
| *1000 – 1015* | *Break* |
| *1015 – 1100* | ***API 571: Damage Mechanisms Part 1 (cont'd)***<br>*Chloride Stress Corrosion Cracking (Cl-SCC) ● Corrosion Fatigue ● Caustic Stress Corrosion Cracking (Caustic Embrittlement) ● Wet H2S Damage (Blistering/HIC/SOHIC/SCC) ● High Temperature Hydrogen Attack (HTHA)* |
| *1100 – 1145* | ***API 571: Damage Mechanisms Part 2***<br>*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)***<br>*Boiler Water Condensate Corrosion ● Sulfidation ● Chloride Stress Corrosion Cracking (Cl-SCC) ● Corrosion Fatigue ● Caustic Stress Corrosion Cracking (Caustic Embrittlement) ● Wet H2S Damage (Blistering/HIC/SOHIC/SCC) ● High Temperature Hydrogen Attack (HTHA)* |
| *1230 – 1330* | *Lunch* |
| *1330 – 1430* | ***Overview – API 510 Inspections of Pressure Vessels***<br>*Scope ● Organization ● Types & Definitions of Maintenance Inspections ● Welding on Pressure Vessels ● Repairs & Alterations*<br>***Overview – API 576 Pressure Relieving Devices***<br>*● Scope ● Types of Pressure Relieving Devices ● Applications ● Limitations* |
| *1430 – 1515* | ***Overview – API 572 Inspection of Pressure Vessels***<br>*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:*** ***Thursday, 17th of December 2026***

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|---|---|
| *0730 – 0830* | ***Review of Day 9*** |
| *0830 – 1000* | ***ASME PCC-2: Repair of Pressure Equipment & Piping***<br>*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* |

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|---|---|
| *1015 – 1130* | ***ASME PCC-2: Repair of Pressure Equipment & Piping (cont'd)***<br>*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***<br>*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)***<br>*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)***<br>*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

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