COURSE OVERVIEW FE0700
API 570: Piping Inspector
(API Exam Preparation Training)

Course Title
API 570: Piping Inspector *(API Exam Preparation Training)*

Exam Window & Venue:
October 11-November 01, 2024/Abu Dhabi, Dubai, Al-Khobar, Jeddah, Kuwa it, Amman, Beirut, Cairo, Manama and Muscat. Participant has the option to attend at any of the above cities

Exam Registration Closing Date:-
August 02, 2024

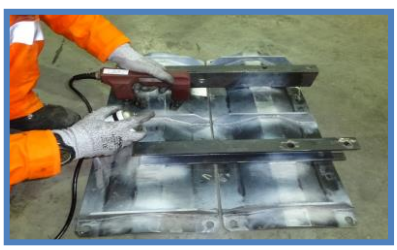
Course Date/Venue

Session(s)	Date	Venue
1	July 14-18, 2024	Al Azziya Hall, The Proud Hotel Al Khobar, KSA
2	October 20-24, 2024	Club B, Ramada Plaza By Wyndham Istanbul City Center, Istanbul, Turkey

Course Reference
FE0700

Course Duration/Credits
Five days (40 hours)/4.0 CEUs/40 PDHs

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 simulators.

The piping system is one of the major assets of any process facility. Maintaining the integrity of the piping system is very critical for the safety and efficiency of the facility. Piping inspection is the first line of defense for maintaining the facility integrity and minimizing the maintenance cost.

API 570 Piping Inspection Code covers inspection, rating, repair, and alteration procedures for piping systems and their associated pressure relieving devices that have been placed in service. This inspection Code applies to all hydrocarbon and chemical process piping systems. The code specifies the in-service inspection and condition-monitoring program as well as repair guidance that is needed to determine and maintain the on-going integrity of piping systems.

This course is designed to provide delegates with a comprehensive overview of the latest API 570 certification program. It will prepare the inspectors to pass the API 570 examination in order for them to be certified as API 570 Inspectors. Course participants will receive in-depth instruction on the applicable codes and standards (API and ASME). They will discuss case studies, and solve homework & quizzes and gain the required knowledge for this high-level certification.

The next API 570 exam and have enough knowledge and skills to pass such exam in order to get the API 570 certification; the inspection, repair, alteration and rerating of in-service piping systems; the API 570 body of knowledge, scope, references, definitions, owner and user inspection organization; the inspection and testing practices, frequency and extent of inspection, inspection data evaluation, analysis and recording, repairs, alteration and rerating of piping systems as well as inspection of buried piping.

The scope, piping components, reasons for inspection, inspecting for deterioration in piping, frequency and time of inspection, and employ safety precautions and preparatory work as well as inspection tools, inspection procedures, determination of retirement thickness and records; the various design conditions and criteria, pressure design of piping components, fluid service requirements for piping components, fluid service requirements for piping joints, piping flexibility, materials, fabrication, assembly and erection, inspection, examination and testing as well as demonstrate nondestructive test methods; the welding discontinuities and discuss ASME section IX WPS and PQR.

Quizzes are given at the end of each section; homework is handed out at the end of each class day, which consists of 30 questions per day and is reviewed at the beginning of the following day, and a “practice” exam is administered at the end of the course.
Haward Technology is proud of its **90% pass rate** on all our API sponsored courses.

Course Objectives

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

- Prepare for the next API 570 exam and have enough knowledge and skills to pass such exam in order to get the API 570 certification
- Perform the inspection, repair, alteration and rerating of in-service piping systems
- Review API 570 body of knowledge, scope, references, definitions, owner and user inspection organization
- Discuss inspection and testing practices, frequency and extent of inspection, inspection data evaluation, analysis and recording, repairs, alteration and rerating of piping systems as well as inspection of buried piping
- Identify the scope, piping components, reasons for inspection, inspecting for deterioration in piping, frequency and time of inspection, and employ safety precautions and preparatory work as well as inspection tools, inspection procedures, determination of retirement thickness and records
- Enumerate the various design conditions and criteria, pressure design of piping components, fluid service requirements for piping components, fluid service requirements for piping joints, piping flexibility, materials, fabrication, assembly and erection, inspection, examination and testing as well as demonstrate nondestructive test methods
- Carryout welding discontinuities and discuss ASME section IX WPS and PQR

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 570 exam. It is designed for those who are involved in the inspection, repair, alteration and re-rating of in-service piping systems. This mainly includes inspectors and inspection engineers who are seeking API-570 certification. Other engineers, managers, mechanical design draftsmen or technical staff who are dealing with piping systems will definitely benefit from this course.

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 570
2-year degree or certificate in engineering or technology or 2 years of military service in a technical role (Dishonorable discharge disqualifies credit)	2 years	Design, construction, repair, operation, or inspection of in-service piping systems, of which one year must be in supervision or performance of inspection activities as described in API 570
High school diploma or equivalent	3 years	Design, construction, repair, operation, or inspection of in-service piping systems, of which one year must be in supervision or performance of inspection activities as described in API 570
No formal education	5 or more years	Design, construction, repair, operation, or inspection of in-service piping systems, of which one year must be in supervision or performance of inspection activities as described in API 570

Required Codes & Standards

Listed below are the effective editions of the publications required for this exam for the date(s) shown above. **Each participant must purchase these documents separately and have them available for use during the class as their cost is not included in the course fees**:-

- **API Standard 570**, *Piping Inspection Code: In-service Inspection, Rating, Repair and Alteration of Piping Systems,* **4th Edition, February 2016 with Addendum 1 (May 2017)**, **Addendum 2 (March 2018), Addendum 3 (June 2023)** and **Errata 1 (April 2018)**
- **API Recommended Practice 571**, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry,* **3rd Edition**, **March 2020**

Section	2	Terms and Definitions
Par.	3.3	Amine Stress Corrosion Cracking
	3.8	Atmospheric Corrosion
	3.9	Boiler Water and Stream Condensate Corrosion
	3.14	Caustic Corrosion
	3.15	Caustic Stress Corrosion Cracking
	3.17	Chloride Stress Corrosion Cracking
	3.22	Corrosion Under Insulation
	3.27	Erosion/Erosion – Corrosion
	3.31	Galvanic Corrosion
	3.37	Hydrochloric Acid Corrosion
	3.43	Mechanical Fatigue (Including Vibration-induced Fatigue)
	3.45	Microbiologically Influenced Corrosion
	3.57	Soil Corrosion
	3.58	Sour Water Corrosion (Acidic)
	3.61	Sulfidation

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	3.37	Hydrochloric Acid Corrosion
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	3.45	Microbiologically Influenced Corrosion
	3.57	Soil Corrosion
	3.58	Sour Water Corrosion (Acidic)
	3.61	Sulfidation

- **API Recommended Practice 574**, *Inspection Practices for Piping System Components,* 4th Edition, APRIL 2017
- **API Recommended Practice 576**, *Inspection of Pressure-Relieving Devices,* **4th Edition, April 2017**

Sections 5, 6.1-6.3, 8 and 10.1-10.3

- **API Recommended Practice 577**, *Welding Processes, Inspection and Metallurgy,* **3rd Edition, October 2020**
- **API Recommended Practice 578**, *Guidelines for a Material Verification Program (MVP) for New and Existing Assets,* **4th Edition**, **February 2023**
- **American Society of Mechanical Engineers (ASME)**, *Boiler and Pressure Vessel Code,* **2021 Edition**
  - **Section V**, *Nondestructive Examination,* Articles 1, 2, 6, 7, 9, 10, and 23 *(Section SE-797 only)*
  - **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)**
  - **B16.5**, *Pipe Flanges and Flanged Fittings: NPS ½ Through NPS 24 Metric/Inch Standard,* **2020 Edition (Issued January 2021)**
  - **B31.3**, *Process Piping,* **2022 Edition (Issued January 2023) with Errata 1 (February 2023)**

PCC-2, Repair of Pressure Equipment and Piping, 2018

ATTENTION: Only the following sections from PCC-2 are included on the exam:

Article 201: Butt-Welded Insert Plates in Pressure Components
Article 206: Full Encirclement Steel Reinforcing Sleeves for Piping
Article 209: Alternatives to Postweld Heat Treatment
Article 210:In-Service Welding on to Carbon Steel Pressure Components or Pipelines
Article 211: Weld Buildup, Weld Overlay, and Clad Restoration
Article 212: Fillet Welded Patches
Article 304: Flaw Excavation and Weld Repair
Article 305: Flange Repair and Conversion
Article 306: Mechanical Clamp Repair
Article 501: Pressure and Tightness of Piping and Equipment
Article 502: Nondestructive Examination in Lieu of Pressure Testing for Repairs and Alternations

Note: **API and ASME publications are copyrighted material. Photocopies of API and ASME publications are not permitted.**

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.

API Certificate(s)

(1) API-570 certificate will be issued to participants who have successfully passed the API-570 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

Certificates are accredited by the following international accreditation organizations:-

- 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 **4.0 CEUs** (Continuing Education Units) or **40 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.

- 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.

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. Tom Hankins is a **Senior Inspection Engineer** with over **30 years** of experience within the **Oil & Gas**, **Refineries**, **Petrochemical** and **Power industries**. His expertise lies extensively in the areas of **Pressure Vessels Inspection**, **Pressure Vessels Maintenance**, **Pressure Vessels Repairs & Alteration**, **RBI Inspection**, **Piping Inspection**, **Shutdown Planning & Operations**, **Structural Steel Inspection**, **Boilers**, **Heat Exchangers**, **Heaters**, **Turbines**, **Furnaces**, **Tanks**, **Rotating Equipment**, **Coatings**, **Refractory Piping**, **Coker & FCC units**, **Pipeline**, **Fabrication**, **QA/QC auditing** and **radiation**. He is also an international expert in several codes and standards such as **API**, **ASNT**, **AMSE**, **ASTM**, **ANSI**, **NBIC**, **AWS**, **NFPA** and **ISO**. He is currently the **Chief Inspector** of one of the major petrochemical plant wherein he is responsible for the **RBI inspection**, shutdown planning and operation.

During his career life, Mr. Hankins has worked with numerous multi-national companies such as the **Shell**, **Lloyds**, **Intertec Moody**, **Petro Rabigh**, **Oceaneering**, **Worley Parsons**, **Weldspec Port**, **Proenergy**, **Velosi**, **Bechtel**, **Fluor**, CH2MHILL,Turner Industries, Techcorr, Ventech, **GE**, Ensco, **Caribbean Inspection & NDT Services Inc.** and Jacobs Engineering holding various key positions as a **Chief Inspector**, **API Inspector**, **CWI Inspector**, **QA/QC Manager**, **NDT Technician** and **Line Support**.

Mr. Hankins has a **Bachelor** degree in **General Business Studies** from **Oklahoma State University**. Further, he is a Certified Welding Inspector (**AWS**), **NBIC Authorized Inspector**, Certified Pressure Vessel Inspector (**API-510**), Certified Piping Inspector (**API-570**), Certified Aboveground Storage Tank Inspector (**API 653**), Certified Refractory Inspector (**API 936**) as well as a **Certified Magnetic Particle Inspection Level II** (**MT**), **Certified Radiographic Inspection Level II** (**RT**), **Certified Dye Penetrant Inspector Level II** (**DPI**), **Certified Ultrasonic Inspection and Automated Ultrasonic Inspector Level II** (**AUT**), **Certified Radiation Safety Officer**, **Certified Quality Management Lead Auditor** and a **Certified Instructor/Trainer**.

Training Fee

Al Khobar	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	**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.

Exam Fee

US$ 1,410 per Delegate + **VAT**.

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 – 0900	***Introduction & Overview of Course Outline***
0900 – 0930	***Review of API 570 Body of Knowledge***
0930 – 1000	***API 570 - Sections 1 – Scope***
1000 – 1015	*Break*
1015 – 1045	***API 570 - Sections 2 - References***
1045 – 1230	***API 570 - Sections 3 - Definitions***
1230 – 1330	*Lunch*
1330 – 1430	***API 570 - Sections 4 - Owner/User Inspection Organization***
1430 – 1500	***API 570 - Sections 5 - Inspection & Testing Practices***
1500 – 1515	*Break*
1515 – 1545	***API 570 - Sections 6 - Frequency & Extent of Inspection***
1545 – 1645	***API 570 - Sections 7 - Inspection Data Evaluation, Analysis & Recording***
1645 – 1700	***API 570/Distribute Homework & Recap***
1700	*End of Day One*

Day 2

0730 – 0830	***Review of Day 1***
0830 – 0930	***API 570 -Sections 8 -Repairs, Alterations & Rerating of Piping Systems***
0930 – 0945	*Break*
0945 – 1045	***API 570 - Sections 9 - Inspection of Buried Piping***
1045 – 1130	***API 570 - Appendix A - Inspection Certification*** ***API 570 - Appendix C - Examples of Repairs*** ***API 570 - Appendix D - External Inspection Checklist for Process Piping***
1130 – 1200	***API RP 574 - Section 1 - Scope***
1200 – 1230	***API RP 574 - Section 3 - Definitions***
1230 – 1330	*Lunch*
1330 – 1400	***API RP 574 - Section 4 - Piping Components***
1400 – 1410	***API RP 574 - Section 5 - Reasons for Inspection***
1410 – 1420	***API RP 574 - Section 6 - Inspecting for Deterioration in Piping***
1420 – 1430	***API RP 574 - Section 7 - Frequency & Time of Inspection***

1430 – 1440	***API RP 574 - Section 8 - Safety Precautions & Preparatory Work***
1440 – 1450	***API RP 574 - Section 9 - Inspection Tools***
1450 – 1515	***API RP 574 - Section 10 - Inspection Procedures***
1515 – 1530	*Break*
1530 – 1540	***API RP 574 - Section 11 - Determination of Retirement Thickness***
1540 – 1550	***API RP 574 - Section 12 - Records***
1550 – 1600	***API RP 577 Terms & Definitions***
1600 – 1615	***API RP 577 Welding Processes***
1615 – 1625	***API RP 577 Weld Symbols***
1625 – 1635	***API RP 577 Electrode Identification***
1635 – 1650	***Administer Quiz 1***
1650 – 1700	***Review Quiz 1 & Recap***
1700	*End of Day Two*

Day 3

0730 – 0830	***Review of Day 2***
0830 – 0845	***ASME B31.3 - Chapter 1 - Scope & Definitions***
0845 – 0910	***ASME B31.3 - Chapter 2 (Part 1) - Design Conditions & Criteria***
0910 – 0940	***ASME B31.3 - Chapter 2 (Part 2) - Pressure Design of Piping Components***
0940 – 1000	***ASME B31.3 - Chapter 2 (Part 3) - Fluid Service Requirements for Piping Components***
1000 – 1015	*Break*
1015 – 1040	***ASME B31.3 - Chapter 2 (Part 4) - Fluid Service Requirements for Piping Joints***
1040 – 1100	***ASME B31.3 - Chapter 2 (Part 5) - Piping Flexibility***
1100 – 1130	***ASME B31.3 - Chapter 3 - Materials***
1130 – 1230	***ASME B31.3 - Chapter 5 - Fabrication, Assembly & Erection***
1230 – 1330	*Lunch*
1330 – 1430	***ASME B31.3 - Chapter 6 - Inspection, Examination & Testing***
1430 – 1445	*Break*
1445 – 1630	***ASME Section V - Nondestructive Test Methods***
1630 – 1645	***ASME Section V - Nondestructive Test Methods (cont'd)***
1645 – 1655	***ASME Section V - Nondestructive Test Methods (cont'd)***
1655 – 1700	***Review & Recap Discussion***
1700	*End of Day Three*

Day 4

0730 – 0830	***Review of Day 3***
0830 – 0900	***API RP 578 Material Verification Program***
0900 – 0930	***API 571 Damage Mechanisms***
0930 – 0945	*Break*
0945 – 1015	***ASME Section IX WPS***
1015 – 1045	***ASME Section IX PQR***
1045 – 1115	***ASME Section IX - Welder Certification***
1115 – 1200	***ASME B16.5 Flanges & Fittings***
1200 – 1230	***API 576 Inspection of Pressure Relieving Devices***
1230 – 1330	*Lunch*
1330 – 1445	***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*

1445 – 1500	*Break*
1500 – 1620	***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*
1620 – 1650	***Administer Quiz 2***
1650 – 1700	***Review Quiz 2 & Recap***
1700	*End of Day Four*

Day 5

0730 – 0830	***Review of Day 4***
0830 – 0930	***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*
0930 – 0945	*Break*
0945 - 1130	***ASME PCC-2: Welded Repairs (cont'd)*** *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*
1130 - 1230	***ASME PCC-2: Mechanical Repairs (Non-Welding Repairs)*** *Flange Repair ● Mechanical Clamp Repair ● Inspection & Repair of Shell & Tube Heat Exchangers ● Examination & Testing*
1230 – 1330	*Lunch*
1330 - 1445	***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*
1445 - 1500	*Break*
1500 - 1615	***General Course Review of Topics***
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 7 days following the course completion. Each participant has only one trial for the MOCK exam within this 7-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