

API 570

Preparation Course for PIPING INSPECTOR Certification

COURSE OBJECTIVE

The main emphasis of this program is to **provide a comprehensive understanding of the design, inspection and maintenance of process piping based on API 570 standards**. Process piping system is one of the critical production assets in process industry. How to adopt code rules for your plant's process piping system and various service conditions will be illustrated with numerous case studies. Important codes will be reviewed and discussed so as to address the difficulties and ambiguities you might have encountered during working.

BENEFITS OF ATTENDING THIS COURSE

- 1** Knowledge of the latest **API publications and other international standards** and its applications on the job:
 - **API RP 574**, Inspection Practices for Piping System Components
 - **API RP 577**, Welding Inspection and Metallurgy
 - **API RP 578**, Material Verification Program for New and Existing Alloy Piping
 - **API RP 571**, Damage Mechanisms (related to Piping Systems)
 - **ASME B31.3**, Process Piping
 - **ASME B16.5**, Pipe Flanges and Flanged Fittings
 - **ASME Sect 5**, Nondestructive Examination
 - **ASME Sect 9**, Welding Qualifications
- 2** Knowledge and expertise that are required for **maintenance, rating, inspection, repair and alteration of in-service piping system**.
- 3** Information of **API Individual Certification Program** and **API 570 Inspector certification process**.
- 4** The **trainer is a practitioner** with in-depth knowledge and experience about the industry that will benefit participants to learn about **knowledge applications in real work**.



THE COURSE IS DESIGNED FOR

Engineers, Supervisors, Managers and personnel in **Piping Inspection, QA/QC, Engineering Design, Mechanical, Operation and Maintenance**. This course will also be beneficial to Inspectors / Engineers who are preparing themselves for the API 570 certification examination.

COURSE METHODOLOGY

The course will use various tools such as **Group Discussion, Case Studies, Practical Exercise, Video**, and **Quiz** to reinforce the understanding.

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COURSE CONTENT

DAY 1

- Introduction, Publications, Course Outline & Body of Knowledge
- API 570, Piping Inspection Code:
 - Scope and definitions
 - Inspection, examination and pressure testing practices
 - Frequency and extent of inspection
 - Data evaluation, analysis and recording

DAY 2

- API 570, Piping Inspection Code (cont'd)
 - Repair, alterations and rerating
 - Inspection of buried piping
- API RP 574, Inspection Practices for Piping System Components
 - Piping components: piping, tubing, valves, fittings and flanges
 - Pipe joining methods
 - Inspection planning
 - Inspection procedures and practices
 - Determination of minimum required thickness
 - Recording
- API RP 578 Material Verification Program for New and Existing Alloy Piping
 - Scope and definitions
 - Extent of verification – new construction, existing piping system and maintenance systems
 - Test methods
 - Evaluation of test results
 - Marking and record keeping

DAY 3

- ASME B31.3 Process Piping
 - Introduction to ASME, scope and definitions
 - Design requirements and sample calculations
 - Materials specifications and limitations
 - Fabrication, assembly and erection requirements
 - Inspection, examination and testing
- ASME B16.5 Pipe Flanges and Flanged Fittings
 - Scope
 - Pressure Temperature Ratings
 - Markings, Materials and Dimensions
 - Test
 - Methods for Establishing Pressure-Temperature Ratings

DAY 3 (continue)

- API RP 571, Damage Mechanisms (related to piping systems in general)
 - Brittle Fracture
 - Thermal Fatigue
 - Erosion/Erosion Corrosion
 - Mechanical Fatigue
 - Vibration-Induced Fatigue
 - Galvanic Corrosion
 - Atmospheric Corrosion
 - Corrosion under Insulation (CUI)
 - Boiler Water Condensate Corrosion
 - Microbiologically Induced Corrosion (MIC)
 - Soil Corrosion
 - Caustic corrosion
 - Sulfidation
 - Chloride Stress Corrosion Cracking (Cl-SCC)
 - Caustic Stress corrosion Cracking (Caustic Embrittlement)

DAY 4

- ASME Section 5
 - Article 1, General Requirement
 - Article 2, Radiographic Examination
 - Article 6, Liquid Penetrant Examination
 - Article 7, Magnetic Particle Examination
 - Article 9, Visual Examination
 - Article 10, Leak Testing
 - Article 23, Section SE-797, Ultrasonic Standards
- ASME Section 9
 - Article 1, Welding General Requirements
 - Article 2, Welding Procedure Qualifications
 - Article 3, Welding Performance Qualifications
 - Article 4, Welding Data

DAY 5

- API RP 577, Welding Inspection and Metallurgy
 - Definitions
 - Welding inspection, processes, procedure, materials
 - Welder qualifications
 - Non-destructive examination
 - Metallurgy
 - Refinery and Petrochemical Plant Welding Issues
- API 570 Practice examination, Open and Closed Book

Exercises : *A number of short exercises will be used to reinforce key topics*

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COURSE FACILITATOR

ABOUT THE FACILITATOR

B.L. HO is an **active consultant and professional in Singapore**. He has more than **18 years of experience** in the international oil and gas (onshore and offshore), marine, shipbuilding and repair industries providing engineering consultancy, asset integrity, materials/corrosion expertise, welding and failure investigations. He had previously held positions as Principal Consultant with DNV, and as Corrosion/Inspection Manager in Shell Seraya Singapore. He also had stationed in Vietnam where he provides and set-up asset integrity management services and systems for BP and Petrovietnam's offshore and onshore facilities.

ACADEMIC QUALIFICATION

- **Master of Science** National University of Singapore, Materials Science & Engineering, 2001
- **Bachelor of Engineering with Honours**, Nanyang Technological University, Mechanical Engineering, 1995

PROFESSIONAL EXPERIENCE

- Asset Integrity & Risk Management Services (AIMS)
- Plant Maintenance and Engineering
- Materials Selection
- Risk-based Inspection (RBI)
- Failure Analysis
- Six Sigma (Green Belt)
- Metallurgy and Chemical Analysis
- Corrosion Assessment, Protection & Material Selection
- Condition Assessment Of Structures & Components
- Welding Consultancy/Inspection/Witnessing
- Non-destructive Testing (MT,PT,UT,RT & ET)
- Fiberscopic Inspection
- Calibration & Mechanical Testing

FIELD EXPERIENCE

Oil & Gas (offshore and onshore), Chemical & Petrochemical, Refineries, Marine, Shipbuilding & Repair, Automobile and Aerospace.

PROFESSIONAL ATTAINMENT

- API 653 Aboveground Storage Tank Inspector Certification (Cert No. 31253)
- API 570 Piping Inspection Certification Program (Cert No. 24410)
- API 510 Pressure Vessel Inspection Certification Program (Cert No. 29563)
- Risk Based Inspection (RBI)
- AWS Certification of Welding Inspectors
- ASNT Level II for MT
- ASNT Level II for PT
- Quality Assurance Level III
- Pipeline Integrity Management Course (DNV)
- Modern Energy Technology (Offshore and Onshore)
- Project Management 1
- Project Management 2
- L281 Storage Tank Maintenance and Inspection
- M123 Safety in Process Design Course
- Hazards & Effects Management Process - Layer of Protection Analysis (HEMP-LOPA)
- Asset Dependability Green Belt Training
- Corrosion Control by Protective Paint
- Assessment of acceptability of flaws by Fracture Mechanics

TEACHING EXPERIENCE

- **Lecturer for API 510, API 570 and API 653** international courses for Petronas, Chevron Indonesia, Shell, BP and Sinopec.
- **RBI Trainer** for public training for Singapore plants such as Celanese, Lonza, PCS, SRC, and for NCSP (Vietnam), Dung Quat Refinery (Vietnam), PIC (Oman), KOC (Kuwait), Malaysia, Indonesia, Philippines and China .
- Lecturer for courses held between year 1999 to 2004. Courses included **Principles of Failure Analysis, Stainless Steels, Corrosion Causes & Prevention, Heat Treatment of Steels, Mechanical Testing of Metals, Principles of Metallography and Thermal Spray Technology**.