Performance Test Codes (PTCs) by ASME

About the Course

ASME Performance Test Codes (PTCs): A Wide Range of Applications

For over 100 years, ASME has been providing industry with a comprehensive collection of the best technical documents to conduct tests of power plant equipment and systems. ASME now offers 48 Performance Test Codes (PTCs), covering four main categories of equipment and systems – Power Production, Combustion and Heat Transfer, Fluid Handling, and Emissions. There are also "general" documents that cover Analytical Techniques, Measurement of Process Parameters and Associated Phenomena and Guiding Information.

Performance test codes provide a "**level playing field**" for both manufacturers and users of the equipment or systems. Both parties to the test can reference the particular test code, confident with the knowledge that it represents the highest level of accuracy based on current engineering knowledge, taking into account test costs and the value of information obtained from testing. Precision and reliability of test results must also underlie all considerations in the development of an ASME PTC, consistent with economic considerations as judged appropriate by each technical committee under the jurisdiction of the ASME Board on Standardization and Testing.

WHO SHOULD ENROLL

Those involved with the purchase, design, fabrication, or inspection of pressure vessels. Some technical background will be helpful, but attendees are not required to have an Engineering degree or previous work experience in the subject matter.

LEARNING OBJECTIVES

Upon completion of this course, students will be able to:

- Be able to deal with material certificates and learn how to receive their certificates;
- Be able to identify many welding wires and heat treatments;
- Be able to set-up the suitable procedure of NDT for the actual working conditions;
- Be able to create and review welding specifications (WPS) and Welding quality reports (PQR);
- Be able to review the drawing sheet related to welding works;
- Having the skills to interpret and evaluate works according to applicable standards, codes, specifications or procedures;
- Having the skills to deal with power lines specifications and process lines;
- Be able to test flanges and all types of Fittings;
- Having the skills and knowledge to set-up a complete inspection plan according to actual working conditions.

Course Content

- ***ASME Section I:***
  Rules for construction of power boiler
  - Types of boilers.
  - Design considerations.
  - Acceptance criteria
  - Maximum allowable stresses

- ***ASME Section II:***
  Materials specifications.
  - History of Materials in the ASME Boiler and Pressure Vessel Code.
  - ***Part A :***
    Ferrous Material Specifications.
  - ***Part B:***
    Nonferrous Material Specifications.
  - ***Part C:***
    Specification for Welding Rods, Electrodes, and Filler Metals.
  - ***Part D :***
    Properties.

- ***ASME Section V:***
  Non-destructive Examination.
  - Article 1, General Requirements.
  - 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 IX:***
  Welding and Brazing Qualifications.
  - Article 1, Welding General Requirements.
  - Article 2, Welding Procedure Qualifications.
  - Article 3, Welding Performance Qualifications.
  - Article 4, Welding Data.
  - Fabrication.
  - Tubular Structure.
  - Strengthening & Repair of Existing Structures.
  - Inspection.

- ***ASME Section VIII :***
  Welding and Brazing Qualifications.
  - Division 1: Design and Fabrication of Pressure Vessels.
  - Division 2: Design & Fabrication of Pressure Vessels

- ***ASME B16.5***
  Pipe Flanges and Flanged Fittings.
  - Scope.
  - Pressure Temperature Ratings.
  - Markings, Materials and Dimensions.

- ***ASME B31.3***
  Process Piping.
  - Introduction to ASME, scope and definitions.
  - Design Requirements and Sample Calculations.
  - Materials Specifications and Limitations.
  - Fabrication, Assembly, and Erection.

- ***ASME B31.1***
  Power Piping.
  - Scope and Definitions.
  - Design Requirements and Sample Calculations.
  - Materials Specifications and Limitations.
  - Dimensional Requirements.
  - Fabrication, Assembly, and Erection.
  - Inspection, Examination, and Testing.

- ***BS EN ISO Quality Management Systems.***
  - Inspection Test Plan.
  - Welding Symbols and Drawings.

ASME PTCs on Power Production

- PTC 6, Steam Turbines
- PTC 6S, Procedures for Routine Performance Test of Steam Turbines
- PTC 6.2, Steam Turbines in Combined Cycles
- PTC 17, Reciprocating Internal Combustion Engines
- PTC 18, Hydraulic Turbines and Pump Turbines
- PTC 22, Gas Turbines
- PTC 29, Speed-Governing Systems for Hydraulic Turbine Generator Units
- PTC 42, Wind Turbines
- PTC 46, Overall Plant Performance
- PTC 48, Overall Plant Performance with Carbon Capture (under development)
- PTC 50, Fuel Cell Power Systems Performance
- PTC 52, Performance Test Code for Concentrating Solar Power Plants (under development)
- PTC 55, Gas Turbine Aircraft Engines
- PTC 70, Ramp Rates
- POM 101, Performance Related Outage Inspections
- POM 102, Operating Walkdowns of Power Plants (under development)
- PTC PM, Performance Monitoring Guidelines for Power Plants

ASME General Documents on Measurement of Process Parameters and Associated Phenomena

- PTC 19.2, Pressure Measurement
- PTC 19.3, Temperature Measurement
- PTC 19.5, Flow Measurement
- PTC 19.6, Electrical Power Measurement (under development)
- PTC 19.7, Measurement of Shaft Power
- PTC 19.22, Data Acquisition Systems
- PTC 36, Measurement of Industrial Sound
- B133.6, Gas Turbine Installation Sound Emissions

ASME PTCs on Combustion and Heat Transfer

- PTC 4, Fired Steam Generators
- PTC 4.2, Coal Pulverizers
- PTC 4.3, Air Heaters
- PTC 4.4, Gas Turbine Heat Recovery Steam Generators
- PTC 12.1, Closed Feedwater Heaters
- PTC 12.2, Steam Surface Condensers
- PTC 12.4, Moisture Separator Reheaters
- PTC 12.5, Single Phase Heat Exchangers
- PTC 23, Atmospheric Water Cooling Equipment
- PTC 30, Air-Cooled Heat Exchangers
- PTC 30.1, Air Cooled Steam Condensers
- PTC 34, Waste Combustors with Energy Recovery
- PTC 51, Gas Turbine Compressor Inlet Air Conditioning Equipment

ASME PTCs on Fluid Handling

- PTC 8.2, Centrifugal Pumps
- PTC 10, Compressors and Exhausters
- PTC 11, Fans
- PTC 12.3, Deaerators
- PTC 13, Blowers (under development)
- PTC 19.11, Steam and Water Sampling, Conditioning, and Analysis in the Power Cycle
- PTC 19.23, Guidance Manual for Model Testing
- PTC 24, Ejectors
- PTC 25, Pressure Relief Devices
- PTC 31, High Purity Water Treatment Systems
- PTC 39, Steam Traps

ASME PTCs on Emissions

- PTC 19.10, Flue and Exhaust Gas Analysis
- PTC 21, Particulate Matter Collection Equipment
- PTC 28, Determining the Properties of Fine Particulate Matter
- PTC 40, Flue Gas Desulfurization Units

ASME General Document on Analytical Techniques

- PTC 19.1, Test Uncertainty

Training Methodology

Throughout this course, the attendees will have the opportunity to practice their skills through a variety of hands-on exercises. These exercises focus on the skills introduced in each lesson. The following are our tools for course conduction:

- Pre-Assessment Questionnaire for use before the Course
- Post-Assessment Questionnaire for use after the Course
- Lectures, Demonstrations, Group Exercises & Case Studies
- Visual aid (Video Simulation) to increase the efficiency of the information
- Evaluation Questionnaires (Course, Instructor, & Administration) filled by Attendees
- Evaluation Questionnaires for Attendees filled by Instructor

Instructor :

Dr.Eng. Wael Hoziefa, ***PhD*** Material Engineering (2016), ***Lecturer*** at faculty of engineering, Al-Azhar University, Corrosion Monitoring ***Project Manager*** for Petrobel at Zohr field, Rig Audit and acceptance team leader (ex; Rig Shams 2 / eshpetco,….) , ***General Manager of KIT*** company for jobs & consultations of (Metallurgy, Welding, Fabrication, NDT classic and advanced, drilling), American Society for Non-destructive testing (***ASNT Member***), NDT level III (MT method).
As overall about 12 years of experience as a lecturer for industrial programs either for individuals or for remarkable companies like (GPC; General Petroleum Company, Arab Contractors, SETCORE, TUBESCOPE, TRIANGLEM, Khalda, Pipe lines company, ...). for ASME, lecturer for about 15 ASME courses which were carried for individuals either from petroleum, construction, or design companies at KIT Company training centre, and for 25 engineer who are the main team of PETROBELL at zohr field.

Cv is attached.