

**Training Title**

**ADVANCED PIPELINE: DESIGN, INSPECTION & TESTING TRAINING**

**Training Duration**

5 days

**Training Venue and Dates**

REF	Advanced Pipeline: Design Inspection & Testing	ME049	5	25 - 29 March, 2019	\$6,250	Madrid, Spain
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In any of the 5 star hotels. The exact venue will be informed once finalized.

**Training Fees**

- 6,250 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**TRAINING DESCRIPTION**

The course will review the basic requirements of the ASME B31 Code for Pressure Piping. Topics include: design conditions, pipe sizing, pressure design, flexibility analysis, material, fabrication, examination, testing, and mechanical integrity for existing piping systems, as provided in API 570 Piping Inspection Code.

**TRAINING OBJECTIVES:**

- To provide the participant with a complete and up-to-date overview of the area of Piping Technology
- The participant will learn the design, fabrication, examination and testing requirements of ASME B31
- Familiarizing the participant with the related standards for inspection and repair of piping systems that have been in service, as provided in API 570, Piping Inspection Code
- The participant will gain a deep understanding of the physical phenomena which affect the operation, durability of piping systems
- Participant will learn to calculate the pipe schedule, and pipe size that serve certain application
- Participant will learn different methods of pipe inspection and testing based on related Codes and Standards
- Participant will exposed to different method of checking pipe flexibility

**WHO SHOULD ATTEND**

Engineers and Technicians of mechanical, and chemical engineering background will benefit largely from this workshop. Maintenance, Operation, inspection, and R and D People should also attend this course.

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**TRAINING METHODOLOGY:**

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

All presentations are made in excellent colorful power point. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

**COURSE OUTLINE :-**

The Following Topics will be covered in this course over five days

**Basics of Piping**

**Pipe Dimensions and Schedule number**

**Pipe Manufacturing Methods**

**Welded and Seamless Pipes**

**Pipe Drawing Symbols**

**Types of pipes – application wise**

**Standard pipe**

**Pressure pipe**

**Line pipe**

**Piping Materials**

**Chemical properties**

**Mechanical properties**

**Physical properties**

**Property stability**

**Classification of steel**

**Steel heat treating practices**

**Aging of properties**

**Piping Codes and Standards**

**ASME Boiler and Pressure Vessel Code**

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**ASME B31: Code for pressure piping**

**API Specifications (Spec), Recommended Practices (RP), and Standards (Std.)**

**Spec. 5L-90: Specification for Line Pipe**

**American Welding Society - AWS Welding Handbook**

## **Pipeline Design**

### **1. Design Parameters**

**Maximum Operating Pressure**

**Flow Rate of Oil or Gas**

**Delivery Pressure**

**Pressure Drop**

**Pumping Power**

### **2. Failure Theories**

### **3. Design Criteria**

**Maximum Allowable Stress**

**Maximum Allowable Pressure**

**Construction Factor**

### **4. Steel Selection**

### **5. Pipe Sizing**

**Pipe Diameter**

### **6. Pipe thickness calculation**

**Pipe Schedule**

## **Pump and Compressor Stations**

**Originating and booster Stations**

**Pump Selection**

**Parallel and Series Operation**

## **Pipeline Installation**

**Off-shore and on-shore installations**

## **Welding Techniques**

**Welding Processes**

**Welding Procedures**

**Weld Passes**

## **Inspection and Testing**

**Visual Inspection**

**Non-Destructive Testing**

**Class designation**

**Hydrostatic testing**

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**Pigging for Cleaning and Monitoring**

**Types of Pigs**

**Monitoring Internal Corrosion**

**Pipe Repair**

**Buried pipelines**

**Corrosion and Cathodic Protection**

**Pipe Coating**

**Stress Analysis**

**Flexibility Analysis Methods**

**Flexibility Analysis Demonstration**

**Equipment Load Limits**

**Cold Spring**

**Elastic Follow-up**

**Fluid Service Requirements**

**NOTE:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**

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