

**Training Title**

**Pipelines: Design, Inspection & Testing Training**

**Training Duration**

5 days

**Training Venue and Dates**

Pipelines Design Inspection & Testing	5	07-11 February	\$3,300	Abu Dhabi
Pipelines Inspection, Repair & Testing	5	02-06 May	\$3,300	Abu Dhabi
Pipeline Design Inspection & Testing	5	10-14 October	\$3,300	Abu Dhabi

Training will be held at any of the 5 star hotels.  
Exact venue will be informed later.

**Training Fees**

- 3300 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultants Certificate of course completion will be issued to all attendees.

**Who Should Attend**

Mechanical engineers, facilities engineers, plant engineers, pipeline engineers and piping system designers who are involved in the design of in-plant piping systems for oil and gas facilities. Top staff has experience in related disciplines and wish to expand or refresh their knowledge of the piping field. 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.

**Training Introduction**

Piping systems are like arteries and veins. They carry the lifeblood of modern civilization.

Piping is a major expenditure in the design and construction of industrial, refinery, petrochemical, or power-generating plants when one considers engineering costs, material costs, and fabrication and field labor costs. Proper planning and execution of the design and routing of pipe can have a major impact on controlling the total installed cost.

The intention of this course is to provide participants with the academic and practical considerations related to piping systems in general. Attention will be focused on process piping as specified and explained by ASME Code B31.3. The course will also handle some piping practical applications.

### Course 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.

### Course 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 be exposed to different methods of checking pipe flexibility

### COURSE OUTLINE :-

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

## Daily Outline

### Day (1)

#### Introduction

##### 1. Piping Components

- 1 Pipe- Flange - Elbow - Tee - Reducer – coupling –bolt - gasket
- 2 Valve Types (Gate – Globe – Ball – Plug – Check – Butterfly)
- 3 Valve Selection And Application Guidelines

##### 2. Piping Materials

- 4 Mechanical Properties of Metals  
(Hardness-Toughness- Fatigue – Creep.....)
- 5 Ferrous Metals (Cast Iron-wrought Iron-Steel)
- 6 Copper and Copper Alloys
- 7 Nickel and Nickel Alloys
- 8 Aluminum and Aluminum Alloys

### Day (2)

##### 3. Piping Codes and Standards

- 9 American Society Of Mechanical Engineers (ASME)
- 10 American Society For Testing And Materials (ASTM)
  - 11 American Gas Association (AGA)
- 12 American Petroleum Institute (API)
- 13 American Welding Society (AWS)
- 14 American Water Works Association (AWWA)

### Day (3)

##### 4. Process Piping (Based on ASME B31.3)

- ✦Types of Process Piping Systems
- ✦Design Conditions (Design Pressure- Design Temperature- Ambient Effects)
- ✦Design Loading Considerations
- ✦Pressure Design of Piping Components (Straight Pipe-bends or elbows-flanges-

expansion joints)

✦ Selection and Limitations of Piping Components

✦ General Process Piping System Considerations (Materials- Pressure Integrity- Operability, Maintenance, Safety, and Accessibility)

✦ Case Histories: Challenges/Solutions

Day (4)

**5. Piping Layout**

**15 Codes And Standards**

**16 Piping Layout Considerations**

**17 Piping Flexibility**

**18 Pipe Support Design**

**19 Valves**

**20 Piping of Centrifugal Pumps**

**21 Vents and Drains**

**22 Buried Piping Systems**

**23 Pipe Racks**

**24 Insulation**

Day (5)

**6. Gas Systems Piping**

✦ General

✦ Gas Pipe And Fittings

✦ Compressor Stations

✦ Corrosion Protection

✦ Piping Inspection And Testing

✦ Operation And Maintenance

**7. Conclusions**

**8. Course Assessment**

**9. Close off**

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

### Training Outcome

After completing the course, the participants will be able to:

- 1 Specify piping components for process and utility applications
- 2 Compare alternative material solutions based on properties and application
- 3 Apply piping codes and standards
- 4 Describe the pipe manufacture and fabrication
- 5 Describe the joining methods and inspection techniques of piping
- 6 Describe the main factors affecting piping layout

### **Training Instructor**

**Dr. Nasser Ahmed Zoghaib**

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DR. ENG. NASSER ZOGHAIB is currently General Manager Exe. of Pipeline Networks Planning in the Egyptian Petroleum Sector. He has intensive experience in mechanical systems acquired in the activities of maintenance, inspection, operation and engineering. He has B.Sc. in Mechanical Energy Engineering, M.Sc. in Petroleum Engineering during which he developed two new pipeline equations and Ph.D. in Pipeline Networks Engineering ( A new procedure for gas transmission was developed). In addition, he authored numerous published papers and training courses. He is a member in the American Society of Mechanical Engineers (ASME) and was included in the famous publication of "Who's Who in the world" in 1997, 2002 & 2006. He is a frequent instructor in many training centers.

## Education

- **Doctor of Philosophy Degree (Ph. D)** in the Optimization of Gas Pipeline Networks" A new procedure for gas distribution was developed". – Faculty of Mining & Petroleum Engineering at Suez-Egypt, 2004.
- **Master Degree (M. Sc.)** in the study of Gas Pipeline Fluid Mechanics  
"Two new gas pipeline equations were developed".  
Faculty of Mining & Petroleum Engineering at Suez-Egypt, 1996.
- **Bachelor of Science (B. Sc.)** at Mechanical Energy Section.  
Faculty of Engineering - Ain Shams University in Cairo-Egypt,  
May 1985.

Professional experience ■ A) The Egyptian Natural Gas Co. (GASCO)

\* **General Manager Ass. of Planning Studies of Gas Networks**

**From 10/2003 till now.**

\* **Dept. Manager of Planning Studies of Gas Networks**

**From 4/2003 till 10/2003.**

- 1- Performing the reliability studies of gas supply sources and consumers and resultant network reliability.
- 2- Studying the inclusion of gas fields and consumers in the gas grid  
(connection points, route selection, pipe diameter, pipe thickness).
- 2- Studying the expansion of gas fields and consumers and recommending the necessary actions of looping/compression and performing the relevant feasibility study on pipeline, gas compressor and gas turbine.
- 3- Studying future balance of supply and demand and the consequent Feasibility of construction of new pipelines / compressors.

\* **Operation Control Senior Coordinator** **From 7/1997 till 4/2003.**

In the Operation Sector, which is responsible for the operation control of the National Gas Grid (NGG). This work includes

- 1-1-Demand and supply estimate, matching & scheduling.
- 2-2-Flow, Pressure & temperature control.
- 3-3-Detecting possible leakage, equipment failure or condensate
- 4-formation.

■ B) Belayim Petroleum Co. ( Petrobel )

--- During work in Petrobel, the main job was in Maintenance Sector but during periods of projects, I was assigned to Project Sector to work in Egypt and abroad in the project various phases such as: Basic and Detailed Engineering, Inspection, Expediting, Manuals Revision, Re-instatement, Testing, Commissioning and Start-up.

\* Inspection Section Head From 1/1996 till 6/1997

In the Inspection Dept., that is responsible for the predictive maintenance activities such as vibration analysis of rotating equipment such as pumps, compressors and gas turbines and ultra-sonic thickness check of stationary equipment such as storage tanks, piping and vessels.

\* Senior Mechanical Engineer From 1/1993 till 12/1995

In the Rotating Machinery Dept., that is involved in the maintenance and troubleshooting of pumps, compressors, gas turbines, internal combustion engines and relevant cost accounting & reliability studies.

\* Mechanical Engineer From 1/1989 till 12/1992

In the Construction Dept. which is mainly involved in the piping works such as welding, filing, machining .....etc

■ C ) Misr-Iran Textile Co. ( Miratex )

\* Mechanical Engineer From 12/1986 till 01/ 1989

During this period, I was responsible for the maintenance & troubleshooting of hydraulic machines and rotating machinery

Papers and publications ☞ "New friction factor derived from study of Egyptian gas-field pipeline" Oil & Gas Journal, Nov. 10, 1997 Vol. 95, No. 45.

☞ "A Study on the Natural Gas Pipelines in Nile Delta Fields" - 13th International Petroleum Conference of Egyptian General Petroleum Corporation EGPC- September 1996 - Cairo, Egypt.

☞ "A Study on Abu Madi - Talkha Gas Pipeline in Nile Delta " - The Fifth International Conference on Petroleum, Mining & Metallurgical Engineering - February 1997 - Suez, Egypt.

☞ "Design & construction of gas pipelines in Egypt", Advances in Pipeline Technologies & Rehabilitation 99, Nov., 1999, Abu Dhabi, UAE.

- ▣ "Optimized Design & Operation of Gas Pipeline Networks", The 9<sup>th</sup> International Mining, Petroleum, and Metallurgical Engineering Conference (MPM), Feb., 2005, Cairo, Egypt.
- ▣ "Optimizing Gas Pipeline Networks", The 1<sup>st</sup> International Gas Conference & Exhibition, May, 2005, Homs, Syria.
- ▣ "Planning of Gas Pipeline Networks", The 6<sup>th</sup> Syrian-Egyptian Petroleum & Chemical Engineering Conference, November, 2005, Homs, Syria.
- ▣ "Euro-Egyptian Natural Gas Co-Operation: Challenges And Ambitions", North African Oil and Gas Summit 2006, September 18-20, 2006, Madrid, Spain.
- ▣ Authored some articles in PETROBEL & GASCO Magazines concerning Engineering & Management.

Professional memberships\* Who's Who selected my biography for inclusion in the 14<sup>th</sup> & 19<sup>th</sup> Edition (1997-2002) of Who's Who in the World due to significant record of Achievement "as mentioned by it".

\* Member in the American Society of Mechanical Engineers (ASME).

"Member # 2655801".

\* Member in the Egyptian Society of Mechanical Engineers.

"Member # 1661".

Languages\* Excellent command of *English Language* "written & spoken".

\* Fair command of *German Language* "written & spoken".

\* Fair command of *Italian Language* "spoken".

Acquired Skills\* Good command of computer skills.

\* Excellent skills at report writing.

\* Distinguished skills to prepare and give presentations.

Appreciated in general for the following :

\* Good communications skills.

\* Good managerial background and leadership.

\* Proactive mentality.

Training

■ **Abroad Training.**

1. "Maintenance Planning & Follow-Up", Agip Co., Italy, (June 1993).
2. "Operation & Maintenance of Gas Compressors ", Nuovo Pignone Co., Italy, (March 1997).
3. "General Control Room", Snam Co., Italy. (Nov. 1998).
4. "Workshop of Efficient Management of Pipeline Systems", LicEnergy Co., Abu Dhabi, UAE, October 1999.
5. "Workshop of Defect Assessment in Pipelines" IBC Co., Abu Dhabi, UAE, November 1999.
6. " Pipe & Piping Technology" , American Petroleum Institute (API) , USA, (July 2001)
7. "Strategic Management", Northeastern University, Boston, USA, (August 2006)

#### ■ Local Training

##### # Technical:

- Design & Construction of Piping System (AUC) - SCADA System (Enppi)- Gas Metering & Reduction Stations (Target).
- Pumps & Compressors Technology - Operation & Maint. of Gas Turbines- Vibration-based Predictive Maint. - Machinery vibration analysis Level 1&2 - Bearing Technology (SKF) -
- Radiographic Testing 1<sup>st</sup> & 2<sup>nd</sup> Level of American Society for Non-Destructive Testing (ASNT) - Wear of Machinery- Failure of Mech. Components- Non-Destructive Testing - Welding Metallurgy- Boilers- Safety & Loss Prevention.

# Management: ISO 9000 series - Report Writing 1&2 - Problem Solving & Decision-making - Supervision (1<sup>st</sup> Level) - Presentation skills (American Champ)- # Computer: Auto Cad 1& 2 - 3D Max - Access - Power Point - Word - Excel- Harvard Graphics.

##### Trainer

- Preparation and training of some technical, management and computer courses at training centers in Egypt and abroad.
- Holding lectures and seminars on selected topics at Petroleum Department in Suez Canal and Al-Azhar universities.

- Clients include: GASCO (Abu Dhabi), Saudi Electricity Co. (SEC), Saudi Basic Industries Co. (SABIC), Elitfaq Iron Rolling Co. (KSA), Saudi Border Guards (KSA), Gasco (KSA), Bahraini Aluminum Co. (Bahrain), Syrian Gas Co. (SGC), Syrian Petroleum Co. (SPC), Furat Petroleum Co. (FPC) , Total France-Lybia, Air Liquide (Egypt), Petrobel, Gupco, Khalda, Bapetco, SOPC, NOC, Enppi, EGPC, EGAS, Abu Quir Fertilizersn (Egypt).....etc.

- Some of the Trainings delivered:

- \* Gas Transportation
  - \* Piping Technology
  - \* Pipeline Design & Construction
  - \* Pipeline Design, Inspection & Testing
  - \* Valve Sélection & Maintenance
  - \* Pump Maintenance & Troubleshooting
  - \* Diesel Maintenance & Operation
  - \* Rotating Machinery
  - \* Gas Turbine Operation & Maintenance
  - \* Bearing Technology
  - \* Gears & Gear Box
  - \* Machinery Alignment
  - \* Machinery Vibration
  - \* Pressure Vessel Design & Operation
  - \* Boiler Operations
  - \* Reliability & Maintenance Engineering
  - \* Maintenance Planning & Scheduling
  - \* Machinery Root Cause Failure Analysis (RCFA).
  - \* Maintenance Management
  - \* Packing & Mechanical Seal
- .....