



Energizing Engineering - Empowering Engineers



ISO 9001 : 2008

Institute of Piping Engineering & Building Services

CERTIFICATE ONLINE TRAINING COURSE



PUMPS – APPLICATION, OPERATION, MAINTENANCE & TROUBLESHOOTING

Course Speaker:

Mohammed Kamal Uddin Ahmed

Pipeline & Pumps Specialist,
Certified Engineer – Saudi Aramco, KSA.
International Trainer & Course Speaker.

ABOUT TRAINING PROGRAM

This training course will introduce participants to the different types of pumps and their associated terminology. Centrifugal and Positive-Displacement pumps, packing, mechanical seals and sealing systems, bearings and couplings will all be discussed. The course addresses factors that prevent pumps from achieving their optimum performance and life. Starting with an initial understanding of fluids and applications, the course also details specifications, design and correct pump type, selection, operating, troubleshooting and care of pumping machinery.

The **Online Training Course** is developed by the faculty of **IPEBS**, who are International Course Speakers and have more than 20 years work & training experience individually.

Training Methodology

The course will be conducted along workshop principles with formal lectures, case studies and interactive hands-on work. Relevant case studies will be provided to illustrate the application of each tool in an operations environment. Audio Visual Aids will be demonstrated on Pump Assembly, Dismantling & Troubleshooting.

PROGRAM FEATURES

- ✓ In-depth course content for easy understanding.
- ✓ Blended Learning: Online contact with faculty.
- ✓ Accessibility to Course Faculty & Counseling Services.
- ✓ Job oriented training program.
- ✓ Student will be job ready, after the course.
- ✓ Student will acquire skills and knowledge similar to working professional.

WHO SHOULD ATTEND

- **Graduating College Students in the following disciplines**

- ✓ Mechanical Engineers
- ✓ Chemical Engineers
- ✓ Petroleum Engineers
- ✓ Production / Industrial Engineers
- ✓ Diploma / ITI

- **Working Professionals**

- ✓ Piping Design / Layout Engineers
- ✓ Piping 3D Cad Engineers
- ✓ Mechanical Engineers
- ✓ Chemical Engineers
- ✓ Static Equipment Design Engineer
- ✓ Process Engineers
- ✓ Fabrication Engineers
- ✓ Inspection Engineers
- ✓ Piping QA / QC Engineers

- **Corporate / Organizations**

- ✓ EPC Companies
- ✓ Piping Equipment Manufacturing Companies
- ✓ Piping Consultants
- ✓ Piping Contractors
- ✓ Thermal Power Plants Industry
- ✓ Ship Building / Marine Industry

COURSE MODULES:

- ✓ **Welcome & Pre Test**
- ✓ **Pumps – Introduction, Classification & Performance**
- ✓ **Pumping & Fluids Impact**
- ✓ **Pumping & Impact of Piping System**
- ✓ **Pump Drives**
- ✓ **Mechanical Seals and Bearings**
- ✓ **Pump Reliability**
- ✓ **Pumping Controls & Installation**
- ✓ **Pump Commissioning and Performance**
- ✓ **Pump Maintenance**
- ✓ **Practical Exercises on Maintenance and Troubleshooting**
- ✓ **Open Discussion & Examination**

Detailed Course Content

Welcome & Pre Test

Pumps – Introduction, Classification & Performance

- Pump Types and Terminology
- Classification of Pumps. Differences and similarities. Photographs and cross-sectional views. List of Manufacturers.
- Centrifugal Pump Classification
- API 610 Types & Features – Overhung, Between Bearing, Vertical Suspended
- Rotary & Reciprocating Pumps Classification

- Pump Performance (Centrifugal and Positive Displacement)
- Net Positive Suction Head (NPSH), Cavitation, recirculation, suction specific speed
- Pump Affinity Laws – Effect of Changes in Pump Speed and Impeller Diameter
- Pump performance curves: head-capacity, power, efficiency
- System curve: static versus friction components
- Operating point control: valve throttling versus speed controller

Pumping & Fluids Impact

Impact of

- Density
- Viscosity
- Temperature
- Corrosivity
- Erosion

Pumping & Impact of Piping System

Effects on pumping

- Head
- Velocity
- Resistance
- Forces
- Expansion, contraction, vibration
- Environment

Pump Drives

- Close coupled
- Direct driven
- Belt driven
- Variable speed drives
- Canned
- Couplings
- Power sources
- Alignment

Mechanical Seals and Bearings

- Conventional Packing Glands
- Mechanical Seals
- Seal Failure Mechanisms
- Maintenance and Repair of Mechanical Seals
- Bearings – failure modes and how to extend life

Pump Reliability

- Couplings
- Alignment: Piping and Baseplates
- Planned Maintenance - Predictive and Preventive
- Reliability Program
- Field Troubleshooting, Specialty Designs, and Performance Modification Techniques

Pumping Controls & Installation

Pump controls and instruments

- Safety controls
- Volume controls

Pump installation issues

- Foundations and bases
- Pipe connections
- Vibration and force isolation
- Environmental protection

Pump Commissioning and Performance

- Testing and commissioning
- Condition monitoring
- Optimizing performance
- Inspection
- Performance measurements

Pump Maintenance

- Pump Breakdown and removal
- Single Stage Pump dismantling and repair
- Preparation for re-assembly
- Pump Assembly
- Vertical and multistage pump repairs

Practical Exercises on Maintenance and Troubleshooting

Open Discussion & Examination

Course Fee Details:

Course Title	Fee for Indian Participants	Fee for International Participants
Pumps – Application, Operation, Maintenance & Troubleshooting – Online Training Course	INR 25,000/-	USD 500/-

For making e – payment for the course fee please find **IPEBS** Bank account details below.

Account Name	IPEBS
Account Number	03182020005287
Bank Name	HDFC
Branch	ABIDS
RTGS / NEFT / IFSC Code	HDFC0004125
SWIFT Code	HDFCINBB

IPEBS Corporate Training Clients:

Company Name	Location	Company Name	Location
Intergraph Consultants	India	SPPC	Sudan
Port of Sohar	Oman	CFPE Technology Solutions	Malaysia
Uhambiso Consultant	South Africa	Qatar Petroleum Technical Center	Qatar
Newtech Consulting Group	Sudan	Petro Vietnam Marine Shipyard	Vietnam
Yashada Consultant	India	Locus Technologies	India
Telstar Life Science Pvt Ltd	India	RasGas	Qatar
BHEL	India	ICB Technimont	India & Italy
IDC Training House SDN BHD	Malaysia	LG-Digitech	Sudan
Sakhlain Energy	Russia	Infotech Enterprises	India
Aveon Offshore	Nigeria	Petroleum Operating Company	Sudan
BPCL	Bhutan	Dr. Reddy's Labs	India
Saitech Engineers	India	Vasavi Power Services	India
Riyan Architects	Maldives	Siddhi Consulting	India
Oryx GTL	Qatar	Qatar Petroleum	Qatar
WNPOC	Sudan	Centroid Technical Services	Sudan
GNPOC	Sudan	MG – Vowgas Group	Nigeria
Fleming gulf	UAE	DAL Group	Sudan

Terms & conditions:

CANCELLATIONS: IPEBS does not provide refunds for Cancellations done after registration & fee payment. However, credit maybe granted to a later program. This credit will be available for up to one year from the date of issuance.

COURSE MATERIAL AGREEMENT: It is the intention of **IPEBS** that the course text and materials supplied to participants at **IPEBS** courses are prepared and issued for the participants' sole use. Codes and standards constantly change and interpretations are issued by the publishing societies. Information contained in **IPEBS** course materials is based on the best available data obtained by **IPEBS** at the time of publication. **IPEBS** is in no way responsible for subsequent use regardless of intention.

PROGRAM CHANGE POLICY: Please note that instructors and topics were confirmed at the time of publishing this document; however, circumstances beyond the control of the training organizers may necessitate substitutions, alterations or cancellations

of the instructors and/or topics. As such, **IPEBS** reserves the right to alter or modify the instructors and/or topics if necessary. Any substitutions or alterations will be updated on our web site.

COURSE CANCELLATION BY IPEBS: IPEBS reserves the right to cancel any course due to circumstances beyond our control. All tuition fees will be refunded in the event of cancellation. **IPEBS** liability is limited to only those tuition fees paid in advance.

FORCE MAJEURE: Except for the obligations to make money payments as outlined hereunder, neither party shall be responsible to the other for delay or failure to perform any of the terms and conditions, or other activities, of this agreement if such delay or failure is caused by strike, war, act of God, or force majeure.

Frequently Asked Questions – FAQ's

Duration of the Course?

Ans: Course Duration is 05 Days.

Daily Class Duration?

Ans: Daily class will be from 09:00am to 05:30pm.

Requirement for the Course?

Ans: Computer / Laptop with Good Internet Connection, Camera and Mic.

Support from IPEBS?

Ans: Faculty assigned to all registered participant of the course. Faculty not only helps to clear the participant's queries while doing the course but also monitors the progress of the participant to help in successful completion of the course.

Mode of Payment?

Ans: You can make the payment through electronic transfer or at **IPEBS** office.

Issue of Certificate?

E - Certificate will be issued by **IPEBS** only on successful completion of the course & will be sent via email to the participant.

Training Methodology?

Ans: Online streaming of lectures, contact with faculty by email or chat groups.

Training Material?

Ans: Printed Material – Course / Class handouts will be provided in printed format and shipped (within India) to the participants.

Soft Copy Material - Data tables, charts, Nomographs, drawings, concept theory, design calculations and practice exercise's will be provided in soft copy.

Demonstration software's and excel spread sheets will be provided.

**** International Shipping charges of printed material - course / class handouts to be borne by participants.**