

## Flowserve Pump Maintenance and Troubleshooting

### Course general description:

This course provides deep and advanced knowledge needed to cover installation, operation, maintenance and troubleshooting situations for Flowserve pumps. Likely participants are all personnel who operate, manage, or are involved in, designing, specifying, selling, sourcing, installing, servicing and maintaining Flowserve pumping equipment. The course qualification recognizes the ability to gain and – where relevant – apply a range of advanced knowledge and understanding.

This training course includes case studies applied on Flowserve pumps, "hands on" learning, and more are presented from a practical and realistic point of view.

### Audience:

This course is intended for professionals working in risk management, process safety, operations, and safety leadership roles, including:

- Engineers, experienced maintenance technicians, operations supervisors, pump application engineers, and salespeople needing to obtain a better understanding of the operation of pumps as they apply to piping systems. All personnel who operate, manage, or are involved in, designing, specifying, selling, sourcing, installing, servicing and maintaining Flowserve pumping equipment can attend this course. It is also suitable for:
- Design Engineers, Plant Engineers, Facility Managers, Building Owners, Plant Operators, Safety Engineers, Recent College Graduates, and Pump Sales Representatives.

### Course objectives:

By the end of the training, participants will be able to:

- Understand and apply basic Flowserve pump principles
- Install, start-up and commission a pump
- Correctly align a pump and motor
- Properly maintain Flowserve pumps and pump systems
- Know how to lubricate pump and the function of seals
- Properly operate a Flowserve pump system
- Read and apply Flowserve pump curve charts
- Identify and distinguish a "pump" from a "system" problems
- Identify, correct and avoid cavitation problems
- Prevent Flowserve mechanical seal failure
- Know and apply the safety precautions when working with pump installation, operation, maintenance and troubleshooting
- Test pump Performance

### Course duration:

5 days

### Course location:

Cairo-Dubai-Istanbul

### Course contents:

#### **Day-1:**

- Pretest
- Safety precautions when working with Pumps – SI Units

- Flowserve Pump Classifications
- Basic pump Theory – How does it work?
- Fluid properties – Density – Viscosity – Specific Gravity
- Applications - Transport and storage.
- Field Flowserve pump description and nomenclature
- Installation in case of negative and positive suction head

**Day-2:**

- Start-up, operation and shutdown
- Priming and auxiliary supplies
- Starting the pump
- Operating checks
- Normal Start Up
- Stopping the pump
- Reading Flowserve Manuals
- Workshop 1

**Day-3:**

- Flowserve Pump Maintenance
- Preventive Maintenance
- Maintenance schedule
- Spare parts
- Tools required
- Assembly and Disassembly
- Bearing
- Mechanical Seal and Packing
- Workshop 2

**Day-4:**

- Flowserve Seal less Pumps – Magnetic Pump
- Lubrication
- Predictive Maintenance
- Vibration Analysis
- Shaft Alignment
- Looseness
- Unbalance
- Coupling
- Workshop 3 Diagnosis Pump Failure

**Day-5:**

- Piping and Valves
- Cavitation problems
- Correctly Adjusting Packing
- Troubleshooting
- Faults
- Causes and remedies
- Course Conclusion
- Posttest and evaluation

**Methodology:**

- 50% lectures & concepts
- 10% Videos
- 10% Case studies
- 10% Exercises
- 10% Discussions
- 10% Software (if applicable or examples)

**Course code: (TEME027)**