



Maintenance Of Pumps



Introduction:

Pumps are among the most widely manufactured items in the world and their various designs permit their use in a variety of applications. Pump running with least troubles and consequent less downtime improves whole system reliability. Right selection & operation, effective maintenance & inspection programs, and skilled staff are essential factors for prolonged pump life. This course will cover the pump operation, maintenance and effective controlling methods. This course is intended to enable the participants to learn more about pumps to achieve this required understanding.

And as pumps are generally critical machines in any production process, and hence it is vital that maintenance is most effective for these units. This course aims to provide delegates with a comprehensive understanding of how to use a combined predictive and preventive maintenance approach to achieve maximum reliability and greatest understanding of any deterioration that may occur. During the course, participant's discussion, comments and own problems are welcomed and encouraged. Short tests will be performed to direct the presented material.

Who Should Attend?

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Maintenance, Operation, Production Engineers, Engineers, supervisory and technical staff involved in the monitoring maintenance and diagnostics of pumps, Senior Technicians working with gas turbines should benefit from this course; senior staff can update and refresh their knowledge by attending this course.

Course Objectives:

By the end of this course delegates will be able to:

- Review the different types of pumps
- Describe the appropriate operation by learning the pump systems.
- Highlight the requirements for proper pump installation.
- Learn the importance and methods of pump maintenance
- Guide the participants to the right steps of pump selection and purchasing
- Discuss the effect of cavitations in pumps.
- Be familiar with the right procedure for pinpointing & eliminating pump problems.
- Have an overview and checklist of pump problems

Course Outline:

INTRODUCTION TO PUMPS

- Basic pump theory
- General Safety Requirements
- Pump Performance Basic Terms
- Pumping Factors

CLASSIFICATION OF PUMPS

- Dynamic pumps
- Centrifugal pumps

- Positive displacement pumps
- Reciprocating Pumps
- Piston, plunger, diaphragm pumps
- Rotary pumps
- Pump glossary

PUMPS SYSTEMS

- Important characteristics of pump systems
- Energy and head in pump systems
- Static Head & Total Head
- Pump Characteristic Curve
- Pipe Friction Calculation

PUMPS OPERATION

- Pump Start Up and Shut Down
- Priming of Centrifugal Pumps
- Parallel and Series Operation
- Abnormal Operation
- Capacity Regulation

PUMPS DRIVERS

- Electric Motors
- Steam Turbines
- Hydraulic Turbines
- Gas Turbines
- Internal Combustion Engines

PUMPS PROBLEMS

- Cavitations
- Check list for Centrifugal Pump Troubles

- Check list for Rotary Pump Troubles
- Check list for Reciprocating-Pump Troubles

PUMPS MAINTENANCE

- Overview of Maintenance Practice
- Pump Maintenance Procedure
- Friction, lubrication and wear mechanisms
- Adhesive wear, abrasive wear, fatigue and fretting
- Machinery life cycles
- Mechanical issues, balancing and alignment
- Statistical reliability analysis
- Root cause of, symptoms and detection mechanisms for imbalance
- Root cause of, symptoms and detection mechanisms for bearing problems
- Cavitations, causes and prevention
- Anti-friction bearings: types, lifetime, mounting, applications, related problems
- Plain and pad bearings, thrust bearings: operation, maintenance, incidents
- Mechanical seals, types, operation, related problems
- Performing a balance
- Vibration monitoring
- Vibration limits
- Lubricant monitoring
- Measurement devices, and what to monitor and where
- Centrifugal Pump: Construction Performance Maintenance Troubleshooting
- Positive-Displacement Pumps: Types, Performance, Troubleshooting
- Rotary Maintenance and Troubleshooting
- The role of condition monitoring in pump and compressor maintenance Diagnostic methods
- Capabilities and limitations of condition monitoring, and the need for a combined approach