Pumps & Compressors Predictive Maintenance & Diagnostics

Introduction:

Pumps and compressors 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.

The course provides the candidates with the knowledge needed to be effective in the inspection, monitoring and diagnostics of pumps and compressors, with emphasis placed upon the importance of a combined condition monitoring and strip-down inspection approach to maintenance. It will investigate the root causes of failure, and relates these to operating conditions and process parameters. Design, installation, lubrication and wear related failure mechanisms are identified and a detailed understanding of the troubleshooting and diagnostic methods needed to detect and identify these is developed.

Who Should Attend?

Engineers, Supervisors, Technicians, Foremen and technical staff involved in the monitoring, predictive maintenance and diagnostics of pumps and compressors

Course Objectives:

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

- About the design and construction of different pumps and compressors
- About different analytical approaches to understanding the failure of all types of pumps and compressors
- About the root causes of failure, and relates these to operating conditions and process parameters
- About the design, installation, lubrication and wear related failure mechanisms
- About the troubleshooting and diagnostic methods needed to detect and identify these is developed
- How to be effective in the inspection, monitoring and diagnostics of pumps and compressors, with emphasis placed upon the importance of a combined condition monitoring and strip down inspection approach to maintenance

Course Outline:

- Friction, lubrication and wear mechanisms
- Adhesive wear, abrasive wear, fatigue and fretting
- Machinery life cycles
- Mechanical issues, balancing and alignment
- Statistical reliability analysis
- Reliability models
- Root cause of symptoms and detection mechanisms for imbalance
- Root cause of symptoms and detection mechanisms for looseness
- Root cause of symptoms and detection mechanisms for misalignment
- Root cause of symptoms and detection mechanisms for gear problems
- Root cause of symptoms and detection mechanisms for bearing problems

- Cavitation, causes and prevention
- Antifriction bearings: types, lifetime, mounting, applications, related problems
- Plain and pad bearings, thrust bearings: operation, maintenance, incidents
- Mechanical seals, types, operation, related problems
- Other seals for positive displacement pumps and reciprocating compressors
- Performing a balance
- Vibration monitoring
- Overall and spectral measurements
- Vibration limits
- Introduction to spectrum analysis
- Lubricant monitoring
- Shape, size, amount, chemical composition of debris
- Analytical techniques
- 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
- The importance of plant inspection
- Measurement devices, and what to monitor and where