Bearing: Selection, Maintenance and Failure Analysis

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Energy Milestones Corporation

Advancing Professionals to the next level

Energy Milestones is proud to be accredited, partner and associated with the following association bodies:

Bearing: Selection, Maintenance & Failure Analysis

Overview

The course is designed for participants to understand the functions of bearings about rotating equipment, their installation, and performance, as well as to recognise the major signals/symptoms of bearing failure. A basic understanding of the principles and practices of predictive maintenance is also covered.

Course Objectives

- Know how lubrication affects machine reliability and determine the financial benefits, as well as the essential implementation steps to achieving lubrication excellence.
- Become familiar with the staffing, training, and culture of the lubrication workforce & describe the composition of lubricants, including crude oil-derived lubricants and synthetic lubricants, in the context of tribology.
- Enumerate the types of lubrication, the characteristics of lubricants under different operating conditions, and various lubricant properties.s
- Recognise the need for internal combustion lubricants for petrol and diesel engines & identify the viscosity classifications for automotive driveline lubrication.
- Learn the importance of hydraulic systems and fluids, as well as the application of miscellaneous lubrication to steam turbine pumps, motors, and compressors.
- Develop an understanding of the use of lubrication systems and exercise cleanliness control in the filtration of lubricants
- Illustrate the various monitoring techniques, vibration and oil analysis for the assessment of the condition of rotating machinery
- Determine the tribology root causes of failures and apply fluid contamination control, including leakage, liquid chemical, temperature, and wear stability.
- Heighten awareness on safety issues, shelf life and contamination potential in the storage of lubricants

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Course Content

1- Introduction:

Construction of bearing, components, and their functions, Material of construc tion, Bearing design for misalignment compensation, Ball screw – for precision machines, Bearing life by design.

2- Causes of failure:

Root cause analysis, Why do bearing fail, Bearing failure stages, Bearing defect frequencies, Displaying fault frequencies, Types of wear, Major signals of Bearing failure, Methods of Failure analysis, Acceleration enveloping signal processing, Standard acceleration and velocity measurement setup, Failure prevention methods, Introduction to noise and vibration analysis, Introduction to thermography, Ultrasonic level 1, level 2

3- Preventive, Predictive maintenance:

Purpose of maintenance, Scheduling of bearing maintenance, Proactive reliability maintenance programs, Comprehensive Bearing maintenance, Improving the reliability of Bearings in the system, Bearing Maintenance and Service, Bearing reliability, Failure prevention met.

4- Corrective actions, Servicing, and checks:

Misalignment, Thrust setting, Setting radial play, Safety precautions that are essential for working, Additional bearing mounting methods, Internal Clearance, Setting Internal Clearance on Spherical Roller Bearings, Bearing Maintenance, Bearing Seals

Course Content

5- Bearing Selection:
Bearing selection criteria for machine application, Type of machine – Low speed, Medium speed, High speed
speed, Type of machine - Heavy nonprecessing, Light Precision, Slides and Spindle movements.

6- Installation:
General principles of plain-bearing installation, Inspection of bearings before fitment, Knowledge
of tools and equipment, following the manufacturer's recommendations.

7- Monitoring Bearing Performance Methods:
Checking the soundness of bearing, Bearing history records for future, Performance monitoring procedure, Monitoring equipment's

8- Tools and service equipment:
Types of tools used for bearing fitment, Procedure for bearing removal, Types of tools used for
bearing removal, Types of bearing fitness tests and records for future.

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Targeted Audience

This course is intended for all maintenance professionals, lubrication technicians, machine and equipment predictive maintenance technicians, reliability and lubrication engineers, superintendents, supervisors and technicians, maintenance managers, supervisors and foremen, rotating equipment engineers, plant engineers & machinery engineers.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games