## ROOT CAUSE FAILURE ANALYSIS – *BEARING* 11.02.1

Bearings are not designed to last forever, when bearings fail before their expected life, they can create a long list of unanticipated consequences including loss of revenue and increased expenses. To resolve and prevent reoccurrence of similar failures, we need to know the root cause of the failure.

#### **COURSE OBJECTIVE**

The course helps participants to identify and interpret premature bearing failures. The course covers root causes of bearing failure from specification and purchase to shipping and storage, installation, lubrication and contamination. It will contain in depth case studies on bearing wear path patterns recognition for common defects such as mishandling, misalignment, lubrication and electrical fluting.

#### **BENEFITS**

- Prevent reoccurrence of similar premature bearing failure
- Prolong bearing service life with correct rectification
- Increase machine availability and efficiency

#### **WHO SHOULD ATTEND**

- Service / repair mechanics
- Maintenance supervisors
- Reliability engineers
- Rotating equipment engineers

#### **PRE-REQUISITE**

No pre-requisite is required. Participants with basic knowledge of bearings are an advantage.

#### **COURSE MATERIALS**

The course is complemented with lecture notes, case study, and discussion of actual bearing failures.

#### **COURSE DURATION**

2 DAYS



Premature bearing failure due to lubrication problem

#### **CANCELLATION POLICY**

If notice of withdrawal is given in writing - 14 calendar days before the course date, 80% of the course fee will be refunded. A 50% refund will be made for cancellation received in writing – 7 calendar days before the course date. After which, NO REFUND will be entertained.

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# **COURSE TOPICS**

#### Lesson 1

#### What Causes Bearing to Fail?

- Specification Incorrect application
- Shipping, Handling & Storage
- Installation Improper mounting procedures
- Maintenance Results of poor maintenance practices
- Lubrication Effects of marginal and excessive lubrication
- Contamination Damage / ineffective sealing
- Operating environment Bearing component reaction to moisture & dirt
- Vibration Unbalance, Misalignment, Looseness

#### Lesson 2

#### Addressing the root causes of bearing wear

- Understanding application & bearing selection
- Storage and Handling Standby machines
- Installation Proper tools and training
- Reliability spectrum Acceptance test
- Lubrication Contamination test / ultrasound test / training

#### Lesson 3

#### **Post Bearing Failure Analysis**

- Identify and interpret actual bearing failures
- Wear path patterns recognition
- Primary bearing failures
- Secondary bearing failures

### Lesson 4 Solution for Failed Bearings

- Possibility causes of failure
- Observation
- Recommendations and solutions



Premature bearing failure due to contamination problem

### Lesson 5 Case Study

- #1 Lubrication
- #2 Installation
- #3 Storage
- #4 Wrong Application



# REGISTRATION



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