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		Rev: 01
		April 2012
KLM Technology Group #03-12 Block Aronia, Jalan Sri Perkasa 2 Taman Tampoi Utama 81200 Johor Bahru Malaysia	<b>INSPECTION OF ROTATING EQUIPMENT COMPONENTS</b>  <b>(PROJECT STANDARDS AND SPECIFICATIONS)</b>	

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## 1.0 INTRODUCTION

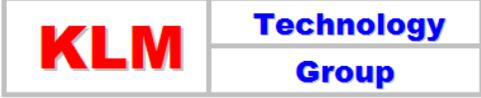
The Rotary Equipment plays a vital role in hydrocarbon processing industry. Timely inspection and maintenance of Rotary Equipment will go a long way in ensuring safer operations of the installations in Oil and Gas Industry.

## 2.0 SCOPE

This document covers the inspection procedure to be followed for anti-friction bearing, (both new and used), coupling and V-belt.

## 3.0 DEFINITIONS

- i) **Tension:** Tension in a belt is defined as a force acting length-wise and is tending to elongate the belt.
- ii) **Torque:** It is the effectiveness of tension which produces rotation about axis.
- iii) **Slack side tension:** It is the minimum tension for a given condition below which the drive will not operate.
- iv) **Tight side tension:** It is the sum of effective tension and slack side tension.
- v) **Creep:** Belt creep is defined as an alternate lengthening and shortening of belt due to cycle of tight and slack tensions. It results in loss of driven speed.

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vi) **Arc of contact:** Arc of contact is defined as:

$$A = 180-60(D-d)/C$$

Where A = Arc of contact in degrees  
D = Diameter of bigger pulley in inches  
d = Diameter of smaller pulley in inches  
C = Centre distance in inches.

#### 4.0 ANTI-FRICTION BEARING

##### 4.1 INSPECTION PROCEDURE-BEARING COMPONENTS

The objective of this examination is to discover all visible defects such as rust, stains, discoloration, cracks, excessive wear, indentation marks caused by careless mounting and blemishes on the surfaces of the bearing component.

The above examination should be carried out methodically. Take one bearing at a time and follow a definite system. Start by looking at the outer ring and examine its outer cylindrical surface, side faces and inside surfaces. Follow the same procedure with the inner ring and then go on to the cage and rolling elements if these parts are accessible for inspection. (If the bearing is of the self aligning type, the inner ring can be swiveled relative to the outer one to enable the rolling elements and outer to be examined).

Next inspect the bearing accessories such as the adapter sleeve, nut and locking washer and finally examine the bearing seatings on the shaft and on the bearing housing.

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#### 4.2 ACCEPTANCE/ REJECTION OF BEARINGS

The acceptance/rejection of bearing should be finalized after evaluating the following points:

- i) Rust can be the cause of a bearing scrapped if it is on the rolling elements or tracks, and this also applies to deep-seated corrosion which may produce a fault on the inner ring or shaft where a fracture is likely to occur; in other cases it may be sufficient to remove the rust.
- ii) Slight discoloration of the rolling elements or tracks is of no importance, but if the rolling elements or the rings are blued or very brown, the bearing should be scrapped, since this indicates that the bearing has run hot and has probably lost some of its surface hardness.
- iii) Fractures and cracks are in all cases a sufficient reason to scrap a bearing. Wear of the bearing seating on the shaft or in the housing means the loss of the bearing fit with regard to particular component, and then worn out part should be replaced if it cannot be repaired. In such a case particles of abraded material have probably entered the bearing and caused wear of associated components. It can also occur due to the ingress of dirt through the seals. If the rolling elements and tracks are worn, there is an increase in the bearing clearance and a reduction in the running accuracy. Some bearings are designed so that the bearing clearance can be controlled by axial adjustment, but if this cannot be done or if the running accuracy is of great importance, the bearing should be replaced. Slight wear of the cage does not mean that the bearing has to be scrapped, but any significant wear gives rise to the risk of failure in which case, the bearing should be scrapped.
- iv) Indentations and other marks are dangerous, if they are in the rolling elements or the tracks. The bearing should also be scrapped if the