University of Huddersfield Repository

Towsyfyan, Hossein, Gu, Fengshou and Ball, Andrew

A review of mechanical seals tribology and condition monitoring

Original Citation


This version is available at http://eprints.hud.ac.uk/19391/

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

http://eprints.hud.ac.uk/
A review of mechanical seals tribology and condition monitoring

Mr H. Towsyfyan
Computing and Engineering

Supervisor: Dr F. Gu, Prof A. Ball

Introduction
Mechanical seals are leakage control devices, which are found on rotating equipment such as pumps to prevent or reduce to a minimum acceptable level leak of gas or liquid from between component surfaces. The seal is made between the very smooth, very flat faces of two rings, one is attached to and rotates with the shaft, and the other is attached to the housing and is stationary.

Primary parts of a mechanical seal

Tribological behavior of seals

Lubrication parameter (log)

An optimum operational region would be around the transition from HL to ML (position a). In this region a low coefficient of friction is accompanied by a low wear rate and a low leakage.

Finite Element Method (FEM) analysis

The maximum penetration occurs at the inner side of the contact region at high temperatures.
(Carmen Sükär 2004)

Condition monitoring of seal faces

- Several attempts have been made to monitor the condition of mechanical seals using Acoustic Emission (AE) technique.
- Some researchers applied advanced signal processing methods to reduce the effect of background noises.

Future Works (research objectives)

- Modelling the AE of frictional wear in seal faces.
- CFD analysis of working condition,
- Application of advanced signal processing techniques to AE raw signals.

Previous researches

- Tribological behavior of mechanical seals
- Finite Element Method (FEM) analysis
- Condition monitoring (CM) of seals.