

Master 2017

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Development and Implementation of a Sensor Determining Wear of Clutches in a Marine Gearbox.

ABSTRACT - Masterthesis

The aim of the research project CoMoGear is the cost-effective status monitoring of highly loaded components in the marine gearbox. For this purpose, an energy-efficient, wireless sensor network is developed. Miniaturized sensor nodes monitor the torque, speeds, temperatures and wear conditions of the torque-transmitting components in the transmission. The energy for operating the sensor nodes is thereby obtained from the environment, for example by using the generator principle on the drive or output shaft. This allows the system to work wirelessly and without external power supply, which significantly reduces the cost of installation and maintenance. Sensor technology, radio technology and autonomous energy supply are to be combined in the research project to a Condition Monitoring System (CMS). Figure 1 shows a typical marine gearbox.



Figure 1: Typical ship's transmission from Reintjes in Hameln
(Source: <http://www.reintjes-gears.de>).

The aim of this master thesis is the development and research of a sensor technology for monitoring the lamellar clutches in marine transmissions. The wear state is to be determined by means of a shortening Δs of the so-called lamella packet. In addition, a test bench is built to validate the measuring system.

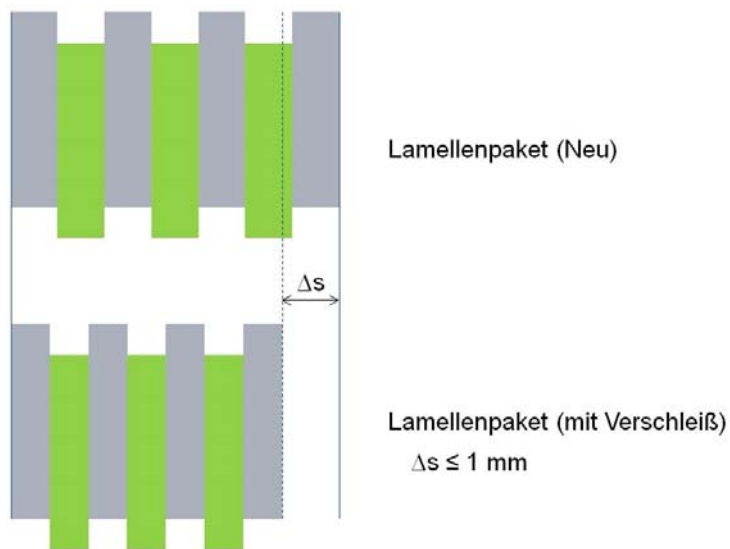


Figure 2: A new slat package is shown at the top consisting of different slats

The work should include the following aspects:

- Familiarization with the topic of length measurement technology
- Research study in the field of Sensor Technologies
- Conception of a sensor for the identification of a length change in the sub-millimeter range
- Software Implementation of a test bench for the identification of change in length
- Studies on the temperature dependence of the length measurement sensors
- Documentation of the work in a suitable form

The work must be carried out in close contact with the signatory examiner or the responsible supervisor. Once a week he has to report on the progress of the work. A publication is not permitted without permission from the IPH. The results of the work must be detailed in a report. The work is to be delivered in two bound copies and on an electronic data carrier.