

Seminar für Systemdynamik und Reibungsphysik

Im Rahmen des Seminars für Systemdynamik und Reibungsphysik spricht

M. Eng. Piotr Grądkowski AGH

University of Science and Technology, Krakow

zum Thema

Predicting the reliability of a heavily loaded slide thrust bearing with elastically supported bearing pads.

Zeit: Mi, 01.12.2010, 16:15 - 17:30 Uhr **Ort:** Raum M 123 (Gebäude M)

Der Vortrag beginnt mit einer Einführung zum Thema

"Scientific activity of the Department of Machine Design and Terotechnology at the AGH

Einführung

The Department of Machine Design and Terotechnology is a part of the Faculty of Mechanical Engineering and Robotics at the AGH University of Science and Technology in Kraków. It employs 32 scientists, who research vast fields of mechanical engineering, including: tribology, biotribology, machine reliability, application of ferromagnetic fluids, heavily loaded bearing systems for power industry and metallurgical engineering industry. Employees of the Department cooperate intensively with other Departments, especially at R&D contracts for mining industry.

The presentation briefly presents the activity of the Department employees in these fields.

Abstract

In some hydro-power stations, the large output turbine sets are supported on thrust bearings of a unique design. To ensure hydrodynamic lubrication conditions at nominal revolution speeds, the bearing is divided into set of self-inclining pads, which are rested on sets of helical springs. During the start-up, a hydrostatic lubrication system is engaged. At the initial phase of turbine operation, a series of failures occurred, as a result of significant scatter of the spring parameters. Some bearing pads had excessive radial tilt, and the continuity of the oil film was lost.

In the presentation, a stochastic model is discussed, which allows determining, during the process of design, the allowable tolerance limits for the spring parameters, so that the loss of fluid friction in the bearing can be avoided. The model involves Finite Elements Method, and multi-objective optimisation in order to determine the parameters of the oil film.