



COLLOQUIUM

Conform artikel 4.6.8 van het SSNS-wb.

Vakgroep: Technische Stromingsleer

In het kader van zijn doctoraalopdracht zal

Roel Arthur Johan Müller

een voordracht houden getiteld:

Systematic Tuning of a Railway Pantograph

Datum: **27 februari 2009**

Tijd: **15:00**

Zaal: **HR C101**

Summary:

The contact force between the pantograph on a train and the overhead catenary wire is an important quantity in the determination of the performance and reliability of the electrical system. During the admission of a new train the aerodynamic forces on the pantograph are tuned using aerofoils attached to the pantograph. The aerofoils have to generate the desired force for both running directions of the train. Presently the selection of these aerofoils is largely based on a time-consuming trial and error process. A method to predict the aerodynamic performance of these aerofoils is desired.

The goal of the present research is derive a model of the aerodynamics of these aerofoils. Furthermore, to present the results in such a way that it facilitates the tuning of new pantograph-train combinations by Lloyd's Register Rail Europe. For this purpose the investigation included: the flow around the train, which determines the flow conditions for the aerofoils; as well as the performance of the aerofoils. For a representative train as well as a representative aerofoil the flow was simulated numerically. Furthermore, a range of aerofoils was investigated in the (silent) wind tunnel of the Engineering Fluid Dynamics group at the University of Twente.

The results are used for the derivation of a prediction model, which is implemented in a MATLAB program. This model predicts the aerodynamic forces on the pantograph, based on a parametric representation of the flow conditions as well as the geometry of the aerofoils. The model awaits validation on a train during a test run.

Examencommissie:

Prof.dr.ir. H.W.M. Hoeijmakers (afstudeerdocent)

De afstudeerdocent,

Ir. R. Volgers (Lloyd's Register Rail Europe) (mentor)

Prof.dr.ir. A. de Boer

Dr.ir. E.T.A. van der Weide

Ir. J.J. Slot

d.d. 2 februari 2009